CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0074
NPDES NO. CA0079316

WASTE DISCHARGE REQUIREMENTS FOR PLACER COUNTY DEPARTMENT OF FACILITY SERVICES PLACER COUNTY SEWER MAINTENANCE DISTRICT NO. 1 WASTEWATER TREATMENT PLANT PLACER COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Regional Board), finds that:

1. Placer County Department of Facility Services, Placer County Sewer Maintenance District No. 1 (hereafter Discharger) submitted a Report of Waste Discharge, dated 28 November 2001, and applied for a permit renewal to discharge treated municipal wastewater under the National Pollutant Discharge Elimination System (NPDES), from the Placer County Sewer Maintenance District No. 1 (SMD1) Wastewater Treatment Plant. Supplemental information to complete the application was submitted 20 December 2001, 4 November 2002, 22 November 2002, 28 February 2003, 11 March 2003, 14 March 2003, 21 March 2003, 8 April 2003 and 18 November 2003.

2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the unincorporated area of North Auburn in Placer County, which serves a population of approximately 15,000 and includes much of the industrial area of Auburn. The treatment plant is located at 11755 Joeger Road in Auburn. The location can be further described as Assessor's Parcel Number 076-080-003, in Section 20, Range 8 East, Township 13 North, Mount Diablo Baseline and Meridian (MDB&M), at Latitude 38° 57' 55" and Longitude 121° 06' 15", as shown in Attachment A, which is part of this Order.

3. A treatment schematic of the Wastewater Treatment Plant (WWTP) is shown in Attachment B, which is a part of this Order. The WWTP provides tertiary treatment when influent flows are 3.5 mgd or less and a mixture of secondary and tertiary treatment when flows are greater than 3.5 mgd. The WWTP consists of the following: Headworks: influent flow meter, comminution, and aerated grit removal; Primary Clarification: four rectangular primary clarifiers; Secondary Treatment: three Rotating Biological Contactors (RBCs), two trickling filters, and four circular clarifiers; Intermediate and final clarification is provided by the four circular clarifiers; Gravity Filtration: six gravity filters with anthracite media; Disinfection: three chlorine contact chambers and dechlorination; Sludge Treatment: primary and secondary digesters, belt press, and sludge drying beds; sludge is treated in the digesters and removed to the belt press or sludge drying beds for liquid removal. The dewatered sludge is disposed at a landfill.

4. The Discharger describes the flow as follows:

Design Dry Weather Flow Rate	2.18	mgd
Average Daily Dry Weather Flow Rate	1.67	mgd

Maximum Average Daily Flow Rate	2.64	mgd
Peak Monthly Average Wet Weather Flow Rate	5.06	mgd
Hourly Peak Wet Weather Flow Rate	8.37	mgd
Daily Peak Wet Weather Flow Rate	8	mgd
pH (minimum)	6.8	
pH (maximum)	8.8	
Average Temperature (summer)	73F	
Average Temperature (winter)	60F	
Average Biological Oxygen Demand (summer)	4.7	mg/l (milligrams per liter)
Average Biological Oxygen Demand (winter)	7.9	mg/l
Average Total Suspended Solids (summer)	1.9	mg/l
Average Total Suspended Solids (winter)	4.2	mg/l
Average Total Chlorine Residual	0.0016	mg/l
Average Ammonia (as Nitrogen)	8.2	mg/l
Average Dissolved Oxygen	6.6	mg/l
Average Total Dissolved Solids	345	mg/l

5. The U.S. Environmental Protection Agency (U.S. EPA) and the Regional Board have classified this discharge as a major discharge.

6. Treated municipal wastewater is discharged from SMD1 to Rock Creek, a water of the State and of the United States. The primary point of effluent discharge to Rock Creek (001) is described as latitude 38°57' 55" and longitude 121° 06' 15". The discharge point on Rock Creek is approximately 200 feet upstream of Dry Creek. A second discharge point (002), located approximately 200 feet upstream of the primary discharge location, is used only when chlorine contact Basin 3 is temporarily offline for routine maintenance. This maintenance is allowed only at times when daily average plant flows are at or below 2.18mgd to maintain a modal contact time of at least 90 minutes. In approximately 1.7 miles, Dry Creek merges with Orr Creek and is called Coon Creek. On Coon Creek, approximately 0.9 miles downstream of the Dry/Orr Creek confluence, there is a diversion dam operated by Nevada Irrigation District (NID).

   a. In western Placer and eastern Sutter Counties, downstream of the NID Diversion Dam, Coon Creek flows approximately 25 miles through a relatively flat area where the flow meanders and splits into several channels, including Main Canal, Bunkham Slough, Markham Ravine, and East Side Canal. Flow from these channels eventually enters Natomas Cross Canal. Flow from Natomas Cross Canal enters the Sacramento River just below the confluence with the Feather River. The total distance from the discharge point on Rock Creek to the Sacramento River is approximately 34.5 miles.

   b. The NID Diversion Dam pulls water from Coon Creek into Camp Far West Ditch or Canal. Water from Camp Far West Ditch follows several flow paths to the Bear River, which is tributary to the Feather River and the Sacramento River, as follows:

c. The majority of the water in Camp Far West Ditch flows into Yankee Slough, which flows directly to the Bear River just upstream of the confluence with the Feather River.

d. A small volume of water in Camp Far West Ditch flows into Camp Far West Reservoir via Renken, Forbes, and Church Canals. Camp Far West Reservoir is constructed on the Bear River.

Beneficial Uses

7. The Regional Board adopted *The Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition – 1998* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. The requirements of this Order implement the Basin Plan.

8. On page II-2.00, the Basin Plan states "*Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams…It should be noted that it is impractical to list every surface water body in the Region.*" For unidentified water bodies, the beneficial uses will be established by the tributary rule. The discharge to Rock Creek is in the Auburn Hydrologic Subarea (514.22), Foothill Drain Hydrologic Area (514.20), American River Hydrologic Unit (514.00), Sacramento Hydrologic Basin, as described in the Basin Plan. Rock Creek is tributary to Dry Creek and Coon Creek. The Basin Plan does not specifically identify the beneficial uses for Rock Creek, Dry Creek, and Coon Creek. However, the Basin Plan does identify existing and potential beneficial uses for bodies of water to which Rock Creek, Dry Creek, and Coon Creek are tributary, as follows:

a. In western Placer County and eastern Sutter County, Rock Creek, Dry Creek, and Coon Creek are tributary to Natomas Cross Canal and the Sacramento River. The discharge enters a section of the Sacramento River between the Colusa Basin Drain and I Street Bridge, the first body of water downstream of Rock Creek, via Natomas Cross Canal, for which the Basin Plan has identified existing beneficial uses. The beneficial uses of the Sacramento River, between the Colusa Basin Drain and I Street Bridge, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply, agricultural irrigation, water contact recreation including canoeing and rafting, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, wildlife habitat, and navigation. Other beneficial uses identified in the Basin Plan apply to the Sacramento River, between the Colusa Basin Drain and I Street Bridge, including groundwater recharge, freshwater replenishment, and preservation of biological habitats of special significance (including the Sacramento San Joaquin Delta).

The Basin Plan, on page IV-24.00, prohibits the direct discharge of municipal and industrial wastes into the Sacramento River from the confluence with the Feather River to the Freeport Bridge. The municipal wastewater from SMD1 enters the prohibited reach of the Sacramento River. However, the discharge to Rock Creek commingles with the waters of Dry Creek, Coon Creek, Main Canal, Bunkham Slough, Markham Ravine, Natomas Cross Canal, and East Side Canal, prior to entering the Sacramento River and does not constitute a direct discharge. Therefore, the discharge does not violate the Basin Plan prohibition.

b. Rock Creek, Dry Creek, and Coon Creek are also tributary to Camp Far West Reservoir and the Bear River via Camp Far West Ditch. The Bear River is the first body of water downstream of Rock Creek, for which the Basin Plan has identified existing beneficial uses. Table II-1 of the Basin Plan identifies existing and potential beneficial uses for the Bear River, including municipal and domestic supply, agricultural irrigation and stock watering, power supply, water contact recreation including canoeing and rafting, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to the Bear River, including groundwater recharge and freshwater replenishment. Upon review of the flow conditions, habitat values, and beneficial uses of Coon Creek, Dry Creek, and Rock Creek, the beneficial uses identified in the Basin Plan for the Bear River are applicable to Coon Creek, Dry Creek, and Rock Creek.

9. Beneficial uses are discussed in Section II of the Basin Plan, which states on page II-1.00 "*Protection and enhancement of existing and beneficial uses are primary goals of water quality planning*…" and regarding disposal of wastewater, states "*…disposal of wastewaters is [not] a prohibited use of waters of the State; is merely a use which cannot be satisfied to the detriment of beneficial uses*." In reviewing whether existing and/or potential uses of the Sacramento River, between the Colusa Basin Drain and the I Street Bridge, and for the Bear River, are applicable to Coon Creek, Dry Creek, and Rock Creek, the Regional Board considered the following facts:

a. Municipal and Domestic Supply and Agricultural Irrigation and Stock Watering Supply:

Municipal, domestic and food crop irrigation beneficial uses have been site-specifically confirmed for waters downstream of the wastewater treatment plant. State Board Resolution No. 88-63, a part of the Basin Plan pursuant to Regional Board Resolution 89-056, requires the Regional Board to assign the beneficial uses of municipal and domestic supply, to Rock Creek, Dry Creek, and Coon Creek.

The State Water Resources Control Board (SWRCB) has issued numerous water rights, for domestic and irrigation uses, on Main Canal and downstream waters, the Sacramento River, the Bear River, and the Feather River, downstream of the discharge. Many of the waterways downstream of the discharge are managed by irrigation districts and retain the domestic and irrigation beneficial uses. Nevada Irrigation District (NID) controls the flows in Dry Creek,

Coon Creek, and Camp Far West Ditch. Staff of NID confirmed the existence of domestic uses of this water by reporting that water from Camp Far West Ditch is utilized for in-home use. NID requires the homeowner to purchase 5 gallons of bottled drinking water per month. NID sells water from Coon Creek and Camp Far West Ditch and has assessed the principal uses as family garden use and pasture irrigation. Over a distance of approximately 25 miles on Camp Far West Ditch, there are 37 irrigation customers, two of whom have irrigation water connected to their homes. Riparian Rights, for landowners along streams and rivers, are not recorded with the SWRCB and have precedence over other water rights and may include domestic and municipal uses. The wastewater discharge occurs in a residential area and the effluent immediately flows through numerous yards lining the Creek. Home garden irrigation has been identified as an existing beneficial use of the receiving stream.

Rock Creek and Dry Creek are low flow streams and may provide groundwater recharge during periods of low flow. Groundwater is a source of drinking water. In addition to the existing water uses, growth in the area downstream of the discharge is expected to continue, creating potential for increased domestic and agricultural uses of the water downstream of the discharge.

b. Hydropower Generation

The discharge of treated wastewater to Rock Creek will not impact the power supply beneficial use of the downstream waters.

c. Water Contact and Non-contact Water Recreation (including canoeing, rafting, and aesthetic enjoyment)

Regional Board staff have surveyed the residents along Dry Creek and found recreational and irrigation use of the receiving stream commonly cited. Several swimming and picnic areas were observed on the banks of Dry Creek and Coon Creek. Properties along Dry Creek and upper Coon Creek are single-family dwellings. The properties have relatively flat terrain that slopes down to the Creeks in their back yards. The Regional Board finds that there is public access to Rock Creek, Dry Creek, Coon Creek, Camp Far West Ditch, Camp Far West Reservoir, the Bear River, the Feather River, and to the sloughs and canals that are downstream of Coon Creek, Natomas Cross Canal, and the Sacramento River. Public use is likely to increase as the population increases. Exclusion or restriction of public use is unrealistic.

Hikers and campers, in the relatively uninhabited areas near the discharge point, Rock Creek, Dry Creek, upper Coon Creek, and Camp Far West Ditch have a reasonable expectation that those waters are as unpolluted as similar streams in the vicinity.

Camp Far West Reservoir, the Bear River, the Feather River, and the Sacramento River are also used extensively for contact and non-contact recreation.

d. Warm and Cold Freshwater Habitats (including preservation and enhancement of fish, invertebrates, and other aquatic resources), Warm and Cold Spawning Habitats, Warm and Cold Migration Habitats, and Wildlife Habitat

The wastewater is discharged into Rock Creek, which flows into Dry Creek, Coon Creek, and downstream waters. The California Department of Fish and Game (DFG) has verified the presence of fish species consistent with both warm water fisheries and cold-water fisheries for salmonids. Fish surveys have not been extensively conducted in the immediate receiving streams, however DFG staff have confirmed that oversummering of cold-water fish species in deeper pools within the Creek is reasonable. Riparian habitats are also a by-product of drainages and canals and provide numerous habitats for birds and mammals.

The Basin Plan (Table II-1) designates the Sacramento and Bear Rivers as both cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote 2), the cold beneficial use designation applies to Rock Creek, Dry Creek, and Coon Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. This Order requires the discharge not cause the instream dissolved oxygen level to fall below 7.0 mg/l.

The U.S. Fish and Wildlife Service has designated the streams and rivers in the Sierra foothills, including Rock Creek, Dry Creek, Coon Creek, and Camp Far West Ditch, to be potential habitat for Red-Legged Frogs. DFG confirmed that the same drainages maintain habitat for Foothill Yellow-legged Frogs and Western Pond Turtles (species of concern) and a variety of macro invertebrates.

The area surrounding the watersheds containing Rock Creek, Dry Creek, upper Coon Creek, Camp Far West Ditch, and downstream waters, provides a wide variety of habitat for wildlife.

e. Navigation

The discharge of treated wastewater to Rock Creek will not impact the navigation beneficial use of the downstream waters.

f. Groundwater Recharge

In areas where the groundwater elevation is below the bottom of a stream, water from the stream will percolate to the groundwater. Rock Creek and Dry Creek are low flow streams at times and it is reasonable to assume that as stream water is lost by evaporation, the remaining flow downstream and percolation to groundwater will provide a source of municipal and domestic supply and irrigation water supply.

g. Freshwater Replenishment

There is hydraulic continuity between Rock Creek and the Bear and Sacramento Rivers. The discharge to Rock Creek contributes to the quantity and may impact the quality of the water in the downstream waters, including Camp Far West Reservoir, and the Bear, Feather, and Sacramento Rivers.

Upon review of the flow conditions, habitat values, and beneficial uses of Rock and Dry Creeks, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Bear and Sacramento Rivers are applicable to Rock and Dry Creeks.

10. Upstream of the discharge from the WWTP, flows in Rock Creek and Dry Creek are both dependent on the flows released from upstream reservoirs; Rock Creek Lake and Halsey Afterbay, respectively. General information, from U.S. Geological Survey maps and site visits, indicates that Rock Creek and Dry Creek were intermittent streams prior to the year-round discharge. Based on the available information, Rock Creek and Dry Creek currently are low-flow or intermittent streams in the absence of the discharge from the WWTP or the upstream reservoirs. The beneficial uses of Rock Creek and Dry Creek must be protected. Due to the low-flow/intermittent nature of the flows in the Creeks, no credit for receiving water dilution is available. Although the discharge flows may maintain aquatic habitat during low flow conditions, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flow and released flows help support cold-water aquatic life. Dry weather and low flow conditions occur primarily in the summer months but also occur throughout the year, particularly in low rainfall years. Significant dilution may occur during and after high rainfall events. However, the lack of available dilution during low flow periods results in more stringent effluent limitations to protect recreational uses, drinking water supplies, agricultural irrigation supplies, and aquatic life.

At times, treated wastewater may be the main (or only) source of stream flow, with little or no dilution from natural flow, particularly in Rock Creek. The worst-case dilution in Rock Creek and Dry Creek is assumed to be zero to provide protection for the receiving water beneficial uses. The impact, of assuming zero dilution within the receiving water, is that discharge limitations must be end-of-pipe limits, rather than allowing for dilution provided by the receiving water. Therefore, this Order contains end-of-pipe effluent limitations.

Wastewater Regionalization

11. The Discharger has actively pursued wastewater regionalization at the new City of Lincoln wastewater treatment plant for numerous Placer County treatment systems, including SMD-1. The City of Lincoln has fully supported the regionalization efforts by constructing an "expandable" wastewater treatment plant and constructing an oversized influent pipeline to the City limits. To date the Discharger has been successful in securing significant federal funding for planning, environmental review and preliminary design work. Environmental analysis, both CEQA and NEPA, have not yet begun. There is a sequential chain of events that must occur before the SMD-

1 facility could reasonably be expected to tie-into the regional system. The new development of Bickford Ranch and the City of Auburn lie between The City of Lincoln and the SMD-1 service area. The Bickford Ranch development is being challenged on environmental issues. The City of Auburn has committed to wastewater regionalization, yet has not conducted a cost effective analysis. Additional federal funding, which has not yet been appropriated, is necessary for regionalization to move forward. To date, none of the potential dischargers to the regional facility have made a financial commitment to construct the necessary discharge pipeline or to purchase capacity at Lincoln. The Discharger has, however asked the Regional Board to extend compliance dates for ammonia, nitrates, CTR constituents and equivalent to tertiary treatment based discharge limitations in this Order until a final determination has been made regarding wastewater regionalization. The Discharger has proposed that by 2 January 2008, based on the outcome of the environmental analysis, the status of additional federal funding, completion of a cost effective analysis and a regional wastewater commitment by Bickford Ranch and the City of Auburn, a determination can be made regarding whether wastewater regionalization is the appropriate means of achieving compliance for the SMD-1 wastewater treatment plant. If regionalization is selected, this information would be considered "new information" under federal regulations, 40 CFR 122.44 (l)(i)(B)(1), and this Order may be reopened for reconsideration of the compliance periods in accordance with applicable laws and regulations. After 2 January 2008, if wastewater regionalization is not the selected compliance alternative, the Discharger has agreed that there would be sufficient time remaining under the currently included compliance period to complete and implement measures to achieve full compliance with this Order.

Tertiary Treatment

12. Rock and Dry Creeks, prior to construction of the WWTP and upstream reservoirs, were low flow or intermittent streams during dry weather and contained water primarily during wet weather. Since construction of the upstream reservoirs and the WWTP, during dry weather and low flow periods, Rock Creek and Dry Creek may, at times be dominated by wastewater effluent. During low flow periods, Rock and Dry Creeks provide little or no dilution for wastewater effluent discharged from the WWTP. The wastewater discharged from the WWTP into Rock Creek, and downstream waters, is reused for municipal, domestic, contact recreation, agricultural irrigation, aquatic life and other beneficial uses. To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease.

    The principal infectious agents (pathogens) that may be present in raw sewage are classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. The filtration process is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreation and food crop irrigation uses.

    In the California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), the California Department of Health Services (DHS) has developed standards for the reuse or reclamation of

wastewater. Title 22 requires, for reuse of wastewater for spray irrigation of food crops, parks, playgrounds, schoolyards, other areas of similar public access, and unrestricted contact recreation, that wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the total coliform organism levels in the effluent not exceed 2.2 MPN/100 ml (Most Probable Number per 100 milliliters), as a 7-Day Median. The required level of treatment is tertiary or equivalent. The Title 22 standards are the minimum wastewater treatment standards necessary to protect public health when wastewater is reused for beneficial uses. There are wastewater treatment processes that provide an equivalent pathogen removal, such as membrane technologies, which could also be utilized to protect the beneficial uses of the receiving stream.

Title 22 standards are not directly applicable to surface waters that receive wastewater and the subsequent reuse of the combined surface water/wastewater. However, the Regional Board finds that it is appropriate to require an equivalent level of treatment to the DHS reclamation criteria because Rock Creek and downstream waters are used for irrigation of agricultural land, for contact recreation and for domestic uses. This Order does not apply Title 22 standards to the discharge of wastewater from SMD1. However, in assessing the discharge standards necessary to the protect the site-specific beneficial uses of Rock Creek and Dry Creek, Title 22 standards were compared to the level of treatment required to protect public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Rock Creek and Dry Creek, as intermittent/low flow streams, are essentially the same as any other conveyance system (pipe or canal) when upstream flows are not present for dilution. DHS has determined that a specific level of treatment is required for reclaimed water delivered in dedicated pipes or canals. Therefore, to protect public health, the same level of treatment is required for water that is delivered in a streambed for the same uses.

It is not practicable to sample wastewater effluent for individual viruses and parasites. Therefore, the number of bacteria, measured as Total Coliform Organisms, in wastewater is an indicator of the effectiveness of the entire treatment train and the effectiveness of pathogen removal. A tertiary or equivalent treatment system is able to achieve a Total Coliform Organism level of 2.2 MPN/100 ml as a 7-Day Median. As an "indicator", solely complying with the total coliform limitation does not indicate that a "tertiary" level of treatment has been provided. The method of treatment is not prescribed in this Order; however, wastewater must be treated to a level equivalent to the tertiary standards recommended by DHS.

As another indicator of effective treatment, a tertiary or equivalent treatment system is also capable of reliably achieving turbidity levels of 2 NTU (Nephelometric Turbidity Units) as a daily average. Failure or bypass of the filtration system, and corresponding reduced removal of viruses, would normally result in an increase in the number of particles in the effluent and higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations.

In addition to coliform testing, a turbidity effluent limit has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. In addition, tertiary treatment processes are able to reduce Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) to lower levels than can be achieved with secondary treatment processes alone. The 30-Day Average BOD and TSS effluent limits for secondary treatment have been revised to 10 mg/l, which is technically based on the capability of a tertiary system.

The requirement to provide tertiary treatment, or equivalent, is based on Regional Board staff's documentation of contact recreation, food crop irrigation and municipal and domestic uses of the receiving stream. Tertiary or equivalent treatment is consistent with the technical analysis conducted to develop the reclamation requirements of California Code of Regulations Title 22, and recommendations from the California Department of Health Services (DHS) contained in *Wastewater Disinfection for Health Protection* (1987), *Technical Justification for the Dilution Ratio for Secondary Effluent* (SDHS), the *Uniform Guidelines for the Disinfection of Wastewater* (1987) and the *Department of Health Services Recommendations for Waste Discharge Requirements* (1 July 2003).

Coagulation and filtration are also effective processes for reducing concentrations of some metals and other pollutants from the waste stream. Discharge of unfiltered water may result in an increase in violations of effluent limitations for some metals that are primarily based on toxicity to aquatic life.

13. Tertiary treatment, or equivalent, is necessary to protect the beneficial uses of the receiving stream. The Discharger's wastewater treatment system provides tertiary treatment. However, flows greater than 3.5 mgd are routed around the gravity filters to the chlorine contact basins. However, excessive wet weather flows, due to inflow and infiltration (I/I), have exceeded 8 mgd. Currently, flows in excess of 3.5 mgd will receive a secondary level treatment but be routed around the gravity filters and flow directly to the chlorine contact basins. Wastewater discharged during periods of high flow is some combination of tertiary and secondary. This Order requires tertiary treatment, or equivalent, for all flows less than 3.5 mgd and utilization of the coagulation and filtration processes to the max extent practicable during wet weather.

14. Prior to permit renewal, anticipating a requirement to provide full tertiary treatment, the Discharger consulted with DHS staff. In a 15 July 2003 letter to Regional Board staff regarding conditions at SMD1 specifically, after their review of plant performance and related effluent quality, expected seasonality of contact recreation and irrigation, high wet weather flow rates, and costs to expand to year-round tertiary and the high influent flow rates, DHS noted several exceptions to the need for tertiary treatment at SMD1 as follows:

    "1. The plant is subject to very high flow rates during, and immediately following storm events. Plant flow that exceeds the capacity of the filters can be allowed to bypass the filtration process

during these events, provided the filter capacity is at least 30% greater than the permitted average dry weather flow.

2. *A 30-day median coliform bacteria count of 2.2 MPN/100 ml can be allowed during the cold weather season. This season can be defined either on the basis of months (e.g., November 1 through April 30), or by receiving water temperature. If you decide to implement the latter, we recommend that the 'cold weather season' be defined as beginning when the seven day median receiving water temperature first falls below 60°F, and ending when the seven-day median receiving water temperature first rises above 60°F."*

A discharge in accordance with the DHS recommendation may not protect contact recreation, food crop irrigation and will not protect the beneficial uses of domestic and municipal supply during periods when the receiving water temperature is less than 60^{o} F and treatment plant effluent flows exceed 3.5 mgd. The beneficial uses of the receiving waters immediately downstream of the discharge have been well documented. It is unknown to what degree water contact recreational activities decrease at 60^{o} F. The nearby American River has well documented periods of contact recreational activity when water temperatures are below $60\ ^{o}$ F. The discharge of blended secondary effluent, compared to a full tertiary discharge, will result in the discharge of additional pollutants. The assessment of compliance with CTR standards and water quality objectives was based on tertiary treatment, and the blended discharge may not comply with discharge limitations. On similar projects, such as the City of Jackson, DHS has recommended that tertiary plus 20-to-1 dilution is necessary to protect documented domestic beneficial uses. Domestic uses have been documented to exist downstream of SMD-1. The Regional Board finds that a tertiary level of treatment, or equivalent, is necessary under virtually all discharge conditions to protect the beneficial uses of the receiving stream.

15. The Discharger's wastewater system has a high wet weather peaking factor, allowing elevated wet weather flows into the collection system. Reduction of I/I flows into the collection system will reduce the need for additional filtration. This Order includes a Provision that requires the Discharger to complete and implement an effective I/I reduction plan.

16. This Order requires that the Discharger may not discharge unfiltered wastewater in any amount, unless the influent flow is greater than 3.5 mgd and the 7-Day Median receiving water temperature is less than 60 °F. This Order contains effluent limitations for tertiary treated wastewater when flow is less than or equal to 3.5 mgd for Total Coliform Organisms, BOD, TSS, and Turbidity. When flow is greater than 3.5 mgd and Temperature is less than 60 °F as a 7-Day Median, this Order contains an effluent limitation for Total Coliform Organism of 2.2 MPN/100 ml as a 30-Day Median as recommended by DHS. To accommodate the discharge of commingled tertiary/secondary wastewater, this Order also contains interim effluent limitations for BOD, TSS, and turbidity that are less stringent than tertiary limits.
As recommended by DHS, when discharging commingled wastewater, additional weekly monitoring is required for Total Coliform Organisms, Fecal Coliform Organisms, *Escherichia coli*, and Salmonella bacteria. In order to determine when the temperature of the receiving water has

achieved less than 60 °F as a 7-Day Median, additional temperature monitoring will be necessary. The existing flow measurements in Rock Creek, Dry Creek, and plant effluent flow monitoring are not adequate for high flows and this Order requires they be upgraded to accurately measure dilution flow ratios while discharging less than tertiary quality effluent. To determine compliance with the lesser treatment requirements recommended by DHS, additional flow measurement will be required for the effluent from the plant, effluent from the gravity filters, flow to the chlorine contact basins, and flows in Rock and Dry Creeks.

17. This Order contains Effluent Limitations less stringent than full tertiary treatment limits during wet weather flow periods when the receiving water temperature is less than 60^{o} F, as recommended by DHS. Tertiary treatment, or equivalent, is necessary to protect the designated beneficial uses of contact recreation, food crop irrigation and domestic and municipal supply. Similar local communities, some with higher wet weather peaking factors, Auburn, Placerville, El Dorado Hills and Cameron Park all provide, or are in the process of completing projects to provide, full tertiary treatment for wet weather flows.

Until the wastewater treatment facility is expanded or close to tying into the Regional Wastewater Plant, this Order allows a treatment level less than tertiary, or equivalent, during periods of high flow and cold temperature. To provide the information necessary to evaluate the need for additional tertiary treatment, or equivalent, in the event the SMD-1 will continue to discharge, this Order requires the Discharger to conduct the following analyses. This Order requires that the Discharger conduct an analysis to determine if bypassing filtration during these limited periods provides BPTC in accordance with State Board Resolution No. 68-16, the antidegradation policy. The BPTC analysis will be due prior to making a decision of whether regionalization is feasible and will require analysis of at least the following:

- Whether 20-to-1 dilution (receiving stream flows to effluent flow) exists during wet weather periods when filter capacity is exceeded,
- Identification and prioritization of wet weather flows in a comprehensive I/I reduction program to assess the amount of flow reduction that can be expected to be achieved,
- A flow equalization analysis to assess the ablity to, and determine what facilities would be necessary to, contain the “excess” wet weather flows,
- An analysis of tertiary treatment design parameters for dry and wet weather flow rates to determine the actual current dry and wet weather design of the filtration system,
- A treatability analysis to determine what treatment train will be necessary to comply with CTR limitations,
- An engineering analysis of the SMD-1 wastewater treatment system and a site specific analysis of the receiving stream beneficial uses, to determine whether the facility provides BPTC,
- A complete and thorough cost analysis of maximizing I/I reduction, providing additional treatment to comply with CTR based limitations, adding equalization basins, building additional filters, tying into the Regional Wastewater Plant and any (and all) other

alternatives evaluated. The cost analysis must contain a detailed basis for the total costs and an assessment of monthly per household/increases for each alternative.

If wastewater regionalization is not the selected alternative and based on the findings of the BPTC analysis, this Order may be reopened and additional equivalent to tertiary discharge limitations may be added to protect the beneficial uses of the receiving waters.

18. The Basin Plan's surface water quality bacteria objective of 200 MPN/100 ml, for fecal coliform organisms, is based on Federal Standards for contact recreational use of surface waters. U.S. EPA, in the *Ambient Water Quality Criteria for Bacteria* (1986), estimates that compliance with the fecal coliform fresh surface water criteria of 200 MPN/100 ml will result in approximately eight illnesses per 1,000 swimmers. In a 28 September 2000 letter to Regional and District Engineers at DHS, the DHS stated that "Federal Standards for water quality where recreational bathing may occur were developed for freshwaters which are not directly influenced by sewage discharges (treated or untreated)." The DHS has documented the reduction of pathogens from various wastewater treatment processes. According to DHS; providing a secondary disinfected quality achieves a 1 to 4 log reduction and a tertiary disinfected quality achieves a 4 to 6 log reduction of viruses from raw sewage. The DHS projected that approximately one illness per 220 bathers would occur from recreation contact in secondary disinfected wastewater which drops to a more acceptable level of approximately one illness per 1,000 bathers with tertiary treatment.

This Order contains Effluent Limitations more stringent that the Basin Plan objective for bacteria and requires a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water in addition to contact recreation of municipal and domestic uses, and food crop irrigation. Although the Discharger provides tertiary treatment except during high flow conditions, in accordance with California Water Code, Section 13241, the Regional Board considered the following:

a. As stated above, Regional Board staff have site-specifically identified the past, present and probable future beneficial uses of the receiving stream to include municipal and domestic uses, contact recreation, and food crop irrigation.

b. The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California Department of Health Services (DHS). The DHS has also stated that domestic or municipal uses are not protected by a tertiary level of treatment.

c. In conformance with Section 101(a)(2) of the Clean Water Act (CWA), "fishable and swimmable" water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area. In recommending to allow partial

filtration system bypass during periods when the receiving stream is less than 60^{o} F, the DHS is stating that it is not reasonable that the receiving waters will be used for recreational purposes and a "swimmable" condition need not be achieved under certain conditions. The discharge of a less than tertiary quality will also result in the discharge of additional pollutants which could degrade aquatic life uses of the receiving stream. Implementation of a tertiary or equivalent level of treatment will achieve compliance with the CWA goals of "fishable and swimmable" waters on a year round basis.

d. The economic impact of requiring an increased level of treatment was considered.

The Discharger has estimated that the construction cost to achieve year-round filtration, with the same type of filters already at SMD1, is approximately $1,000,000 per million gallons per day of additional capacity, or a minimum of $5,000,000. This assumption is based on average dry weather design flow rates, utilizing the operational range of treatment systems at peak wet weather flow conditions, installation of sufficient additional filters could cost significantly less than projected by the City. Peak wet weather flow rate is the problematic parameter at this facility with respect to providing tertiary treatment. Other wastewater dischargers in the area successfully utilize more than one type of filtration. The costs to add the "same type" of filters at SMD-1 eliminates any opportunity for cost savings.

Regional Board and State Board staff gathered information relating to the City of Auburn Wastewater Treatment Plant improvements. The City of Auburn installed new continuous backwash Dynasand Filters to handle 6 mgd of flow. The cost of the filters and associated infrastructure was $1.9 million. Included in the cost were concrete structures, pumps, a rapid mix tank, a chemical building, electrical work, piping, and the filters themselves. Accounting for inflation, the cost today would be approximately 20% higher, resulting in a cost of $2.2 - $2.3 million for filters and associated structures for a flow of 6 mgd. The approximate cost per million gallons would be $370,000 – $380,000. The initial costs are less with the Dynasand Filters but operation and maintenance costs are higher than other filters.

The cost of additional filtration is only necessary to offset the cost to treat wet weather flows above 3.5 mgd. Reducing I/I flows would reduce the cost of additional filters. The cost of reducing I/I and the associated reduced need for additional filters could not be assessed with the available information.

The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting domestic uses, the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. To the extent that beneficial uses are adversely impacted due to the partial bypass of the filters during wet weather flows, the bypass will result in unquantified economic impacts

The Discharger has not assessed the means of compliance with effluent limitations for individual pollutants. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for potentially expensive advanced treatment.

e. The need to develop housing in the area will not be significantly impacted by the requirement for tertiary treatment. The level of tertiary treatment is not being increased over that which is already being provided by the Discharger.

f. It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

Narrative Objectives

19. The federal Clean Water Act (CWA) mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law. (33 U.S.C., § 1311(b)(1)(C); 40 C.F.R., § 122.44(d)(1)) NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality*." Federal Regulations, 40 CFR, Section 122.44(d)(1)(vi), further provide that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits*."

20. The Regional Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives") that specifies that the Regional Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives*." This Policy complies with 40 CFR 122.44(d)(1). With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA's published water quality criteria, a proposed state criterion (*i.e.*, water quality objective), or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Board's "Policy for Application of Water Quality Objectives")(40 C.F.R. 122.44(d)(1)(vi) (A), (B) or (C)). The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*". The Basin Plan requires the application of the

most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The beneficial uses include municipal and domestic supply, agricultural irrigation supply, water contact and non-contact recreation and aquatic habitat and migration. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Board may apply limits more stringent than MCLs. When a reasonable potential exists for exceeding a narrative objective, Federal Regulations mandate numerical effluent limitations and the Basin Plan narrative criteria clearly establish a procedure for translating the narrative objectives into numerical effluent limitations.

Reasonable Potential Analysis and Effluent Limitations

21. U.S. EPA adopted the *National Toxics Rule* on 5 February 1993 and the *California Toxics Rule* on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP), which contains guidance on implementation of the *National Toxics Rule* (NTR) and the *California Toxics Rule* (CTR).

22. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. To implement requirements of the SIP, the Discharger's Report of Waste Discharge contained information as to whether the levels of NTR, CTR, or other pollutants in the discharge from the WWTP would cause or contribute to an in-stream excursion above a water quality or Basin Plan numeric or narrative objective. The Discharger collected the required samples, submitted them for analysis, and once the results were complete, submitted the results in a report titled "*Effluent and Receiving Water Quality Assessment for the Sewer Maintenance District No. 1 Wastewater Treatment Plant*", dated 28 February 2003. Tables 1 through 6 of the attached Information Sheet contain a summary of the laboratory analytical results contained in the report. Based on the Discharger's information (including monthly monitoring reports and past sampling results submitted by the Discharger), Effluent limitations are included in this Order.

23. Section 13263.6(a), California Water Code (CWC), requires that "*the regional board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to*

Know Act of 1986 (42 U.S.C. [United States Code] *Sec. 11023)* [EPCRKA] *indicate as discharged into the POTW, for which the state board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective.*"

The Regional Board adopted numeric water quality objectives in the Basin Plan. In the Basin Plan, Table III-1, Trace Element Water Quality Objectives, contains numeric water quality objectives for the Sacramento River from Keswick Dam to the I Street Bridge, for Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, and Zinc. The discharge from the WWTP is discharged to Rock Creek, an eventual tributary to the Sacramento River between Keswick Dam and the I Street Bridge.

In the Basin Plan, Table III-3, Electrical Conductivity and Total Dissolved Solids, contains numeric water quality objectives for the Sacramento River at the I Street Bridge, for Electrical Conductivity. The numeric objectives are 240 micromhos/cm (50 percentile) or 340 micromhos/cm (90 percentile).

Table III-3 also contains numeric water quality objectives for Electrical Conductivity in the Feather River from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Rock Creek is also eventually tributary to the Feather River between the Fish Barrier Dam and the Sacramento River. The numeric objective is 150 micromhos/cm (90 percentile).

The discharge into Rock Creek in central Placer County travels many miles of tributary waters, through western Placer County, eastern Sutter County, and northern Sacramento County before entering the Feather and Sacramento Rivers. It is not likely that the discharge from the WWTP into Rock Creek will impact the concentrations of Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, and Zinc, and the Electrical Conductivity in the Sacramento River or the Electrical Conductivity in the Feather River. As detailed elsewhere in this Order, available effluent quality data indicate that none of these constituents have a reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included in the Basin Plan for the Sacramento and Feather Rivers. Therefore, Effluent Limitations pursuant to CWC Section 13263.6(a) and the EPCRKA are not proposed for Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc, and Electrical Conductivity. (Effluent Limitations for Copper, Manganese, Silver, and Zinc are included in this Order pursuant to other water quality standards or objectives and are discussed in further detail below.)

24. Many of the pollutants limited in this Order are hardness and/or pH dependant. Information submitted by Nevada Irrigation District confirms that the water supply to the receiving stream is from various watersheds, which may have significantly different hardnesses. Review of the hardness data for the wastewater discharge also shows extended periods with high or low hardness indicating the varying sources of water supply. The low hardness of the receiving stream and the wastewater discharge could occur at the same time resulting in critical hardness values.

Information submitted as a supplement to the Report of Waste Discharge shows, in part, the following critical hardness and pH values:

Effluent Hardness	R-1 Hardness	Effluent pH
61 mg/l		
	20 mg/l	
		6.2 pH units

The toxicity to aquatic life varies from several metals varies with hardness. As hardness concentrations decrease, the toxicity of these metals to aquatic life increases. The CTR Criteria for these metals and the Ambient Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent. The monitoring data submitted by the Discharger contained effluent hardness data that ranged between 61 and 340 mg/l. In addition, the Discharger submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to technical advise from SWRCB staff, Effluent Limitations based on upstream hardness may be overprotective, while the protection provided by Effluent Limits based on the hardness of the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in this Order. While the worst-case hardness may be utilized to determine reasonable potential, the Effluent Limitations vary with hardness by utilizing the hardness-dependant equations.

25. Based on DHS' written opinions and recommendation, this Order also contains additional weekly receiving water monitoring during bypass events, for Total Coliform Organisms, Fecal Coliform Organisms, *Escherichia coli*, and Salmonella Organisms. Additional receiving water temperature monitoring will also be required between 1 October and 30 May. Additional flow monitoring will be required for the plant effluent, effluent from the gravity filters, and flow to the chlorine contact basins in order to determine compliance with the DHS recommendation.

26. The CTR Human Health criterion for **Mercury** (expressed as total recoverable metal) in waters that are sources of drinking water (consumption of water and aquatic organisms) is 0.05 µg/l as a 30-day average. In the Code of Federal Regulations 40 CFR Part 131, U.S. EPA acknowledges that the 0.05 µg/l human health criteria may not be protective of some aquatic or endangered species. In the CTR, U.S. EPA reserved the Mercury criteria for fresh water and aquatic life and may adopt new criteria at a later date.

The Basin Plan contains a list (known as the 303(d) List) of Water Quality Limited Segments (WQLSs) that "are those sections of lakes, streams, rivers, or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate effluent limitations for point sources". The Basin Plan goes on to state, "Additional treatment beyond minimum federal requirements will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment." In addition, Camp Far West Reservoir, downstream of the discharge, has been found to contain high levels of mercury.

Wastewater from the treatment plant discharges to Rock Creek and eventually flows into the Sacramento River, which then flows to the Sacramento-San Joaquin Delta. The Sacramento-San Joaquin Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act, because of Mercury. Because the Sacramento-San Joaquin Delta has been listed as an impaired water body for Mercury, the discharge must not cause or contribute to an increase of Mercury levels. Section 1.3 of the SIP, requires establishment of an Effluent Limitation when the detected concentration exceeds an applicable criterion or objective.

Effluent monitoring data recently submitted by the Discharger (see Table 1 of the Information Sheet) showed total recoverable Mercury in twelve samples at concentrations of 0.00162, 0.00174, 0.00195, 0.00220, 0.00248, 0.00255, 0.0027, 0.0034, 0.00350, 0.0071, 0.0074, and 0.00987 µg/l. The reported concentrations of Mercury do not exceed the CTR Human Health criterion, therefore, a concentration-based Effluent Limitation is not proposed. However, the Effluent does contain a mass of Mercury, which may contribute to an increase in Mercury in the Sacramento-San Joaquin Delta. Therefore, a mass-based final Effluent Limitation for Mercury, in lbs/day, is included in this Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The mass limit for Mercury is calculated using the maximum flow rate and maximum detected concentration [(*X* mg/l) x (8.345) x (Max Flow Rate in mgd)] = *Y* lbs/day). This limitation is based on maintaining the Mercury loading at the current level until a Total Maximum Daily Load (TMDL) can be established and U.S. EPA develops Mercury standards that are protective of human health.

The highest average monthly flow reported within the last twelve months was 2.56 mgd in December 2002. Using the highest average monthly flow of 2.56 mgd and the maximum detected Mercury concentration of 0.00987 µg/l, the approximate maximum mass of Mercury discharged monthly is 0.00021 lbs/day as a monthly average. The Mercury Effluent Limitation is based on current effluent concentrations. A schedule is not necessary for the Discharger to achieve compliance. Compliance time schedules have not been included since the discharge currently meets the concentration based limitation and the mass limitation can be met through implementation measures and/or by limiting new sewer discharges containing mercury concentrations. If U.S. EPA develops new water quality standards for Mercury, this permit may be reopened and new Effluent Limitations added and/or the existing Effluent Limitation adjusted, as appropriate.

27. Existing Order No. 97-113 contains Effluent Limitations for **total coliform organisms** of 2.2 MPN/100 ml as a Monthly Median and 23 MPN/100 ml as a Daily Maximum from 1 May through 31 October, and 23 MPN/100 ml as a Monthly Median and 230 MPN/100 ml as a Daily Maximum from 1 November through 30 April. Seasonal limitations are not technically based and are not protective of the beneficial uses of the receiving stream since contact recreational, food crop irrigation and domestic uses can occur between November and May.

    Title 22 of the California Code of Regulations states that reclaimed water shall be considered adequately disinfected for spray irrigation purposes if the median value of Total Coliform Organisms does not exceed 2.2 MPN/100 ml for the last 7 days for which analyses have been completed, the number of total coliform bacteria does not exceed 23MPN/100 ml in more than one sample in any 30 day period, and no sample shall exceed 240 MPN/100 ml. When flow is less than or equal to 3.5 mgd, to provide Title 22-equivalent waters, this Order contains final Effluent Limitations of 2.2 MPN/100 ml as 7-Day Median, 23 MPN/100 ml as a Daily Maximum that may be exceeded only once in a 30 day period, and 240 MPN/100 ml as Daily Maximum. These Effluent Limitations are based on the capabilities of the existing tertiary treatment facility. When flow is less than or equal to 3.5 mgd, the treatment plant achieves a tertiary level of treatment and therefore, no schedule is needed for compliance.

    When flows are greater than 3.5 mgd and the 7-Day Median temperature of the receiving water is less than 60 °F, and the filters are bypassed, this Order contains interim Effluent Limitations of 2.2 MPN/100 ml as a 30-Day Median and 23 MPN/100 ml as a Daily Maximum that may be exceeded only once in a 30 day period, and 240 MPN/100 ml as Daily Maximum. These Effluent Limitations are based on DHS recommendations, which were based on the current treatment capabilities, therefore, no schedule is necessary for compliance.

28. Tertiary treatment is generally considered to include primary and secondary treatment, with coagulation and filtration. U.S. EPA has not established performance standards for tertiary treatment. However, based on observed treatment capabilities, tertiary treatment is able to achieve both **BOD and TSS** levels of 10 mg/l as a Monthly Average, 15 mg/l as a Weekly Average, and 25 mg/l as a Daily Maximum, with a minimum 85% removal rate.

    Existing Order No. 97-113 contains seasonal Effluent Limitations of 10 mg/l (Monthly Average), 15 mg/l (Weekly Average), and 25 mg/l (Daily Maximum) for both BOD and TSS from 1 May through 31 October. From 1 November through 30 April, the existing Order contains Effluent Limitations of 20 mg/l (Monthly Average), 30 mg/l (Weekly Average), and 50 mg/l (Daily Maximum) for both BOD and TSS.

    To provide Title 22 equivalent waters this Order contains final Effluent Limitations of 10 mg/l (Monthly Average), 15 mg/l (Weekly Average), and 25 mg/l (Daily Maximum), with a minimum 85% removal rate, for both BOD and TSS, when flow is less than or equal to 3.5 mgd. These Limitations are based on the design technical capability of tertiary treatment systems and no

schedule is necessary for compliance. When flows are greater than 3.5 mgd, the gravity filters will be bypassed and the discharge from the plant will be some combination of tertiary and secondary treated wastewater. When flow is less than 3.5 mgd and the 7-Day Median temperature of the receiving water is less than 60 °F, and the filters are bypassed, this Order contains interim Effluent Limitations of 20 mg/l (Monthly Average), 30 mg/l (Weekly Average), and 50 mg/l (Daily Maximum), with an 85% removal rate. These effluent limits are midway between secondary and tertiary treatment capabilities and were in the previous Order, therefore, no compliance schedule is necessary

29. Existing Order No. 97-113 contains seasonal **turbidity** Effluent Limitations of 2 NTU as a Monthly Average and 5 NTU as a Daily Maximum from 1 May through 31 October. The existing Order contains no Turbidity limitation between 1 November and 30 April. Title 22 criteria for filtered wastewater require that Turbidity not exceed; (a) an average of 2 NTU in a 24-Hour period, (b) 5 NTU more than 5% of the time in a 24-Hour period, and (c) 10 NTU at any time. To provide Title 22 equivalent water, this Order contains final Effluent Limitations of 2 NTU as a 24-Hour Average and a Daily Maximum between 5 NTU and 10 NTU, as described above, when flow is less than or equal to 3.5 mgd. In the interim, this Order contains no turbidity limitations when flow is greater than 3.5 mgd and the 7-Day Median temperature of the receiving water is less than 60 °F. There are also year-round Receiving Water Limitations for Turbidity based on Basin Plan numeric standards.

30. The Basin Plan includes a water quality objective for **oil and grease** in surface waters, which states "*Waters shall not contain oils, greases, waxes, or other materials in such concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*."

    The term "grease" as commonly used in relation to food, food processing, and restaurants, includes fats, oil, and waxes. Grease content is determined by laboratory extraction of a waste sample with trichlorotrifluoroethane. Other extractable waste oils and greases include mineral oils, such as kerosene and lubricating and road oils. Fats and oils are compounds of alcohol or glycerin with fatty acids, and are composed of carbon, hydrogen, and oxygen in varying proportions. Fats and oils enter wastewater as butter, lard, margarine, vegetable fats and oil, meat, seeds, nuts, and certain fruits. Kerosene, lubricating and road oils are derived from petroleum and coal tar and are made up essentially of carbon and hydrogen. These oils generally reach the sewers from shops, garages, and streets. Greases and oils tend to coat surfaces, interfering with biological action and causing maintenance problems within WWTPs.

    For Oil and Grease, U.S. EPA has developed National Ambient Water Quality Criteria for the Protection of Human Health for the consumption of water and fish that requires that surface water be "Virtually free from oil and grease, particularly from the tastes and odors that emanate from petroleum products." U.S. EPA has also developed National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life that states that Oil and Grease should be limited to "0.01

of the lowest continuous flow 96-hour LC50 to several important freshwater and marine species, each having a demonstrated high susceptibility to oils and petrochemicals; surface waters shall be virtually free from floating nonpetroleum oils of vegetable or animal origin, as well as petroleum derived oils."

When developing effluent limits for an NPDES permit, pollutants controlled by the BAT and BCT requirements generally have Technology-Based Effluent Limits. For Oil and Grease, there are no numerical water quality standards on which to base Water Quality-Based Effluent Limits (except for Taste and Odor criteria for Total Petroleum Hydrocarbons).

Observation and experience by treatment plant operators and regulators have found that oily waste having an average oil content less than 10 mg/l does not interfere extensively with operation and maintenance of WWTPs. Oil and Grease concentrations above 10 mg/l have a reasonable potential to causes exceedance of Receiving Water Limitations for Oil and Grease, Floating Material and Suspended Material. Based on BPJ, existing Order No. 97-113 contains concentration- based Effluent Limitations for Oil and Grease of 10 mg/l as a Monthly Average and 15 mg/l as a Daily Maximum. This Order contains the same concentration-based Effluent Limitations.

The California State Water Resources Control Board has established a Taste and Odor Threshold for Total Petroleum Hydrocarbons as Gasoline (TPHg) of 5 µg/l. U.S. EPA has established Suggested-No-Adverse-Response Levels for Taste and Odor for Total Petroleum Hydrocarbons as both Diesel Oil and as Kerosene (TPHd and TPHk) of 100 µg/l. The BTEX constituents comprise only a portion of TPHg. Without analytical data for TPHg, TPHd, and TPHk, it is not possible to determine whether the effluent exceeds the Taste and Odor Thresholds and whether Effluent Limitations are necessary. Therefore, a Provision is included that requires monitoring for the presence of TPH. A reopener is included if monitoring shows that Effluent Limitations are necessary.

31. Section III of the Basin Plan contains a numeric Water Quality Objective for **pH**. Numeric Water Quality Objectives are commonly applied to the receiving water as Receiving Water Limitations. However, in this case, the flow of the receiving water has been characterized as a low flow/intermittent stream providing no dilution. Therefore, end-of-pipe Effluent Limitations for pH were included in previous Order No. 97-113 and in this Order. Receiving Water Limitations for pH are also included in the Order to be protective of the Water Quality Objectives.

    On page III-5.00, the Basin Plan Water Quality Objective for pH states, "*The pH shall not be depressed below 6.5 or raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*." Cold and warm-water habitat is a beneficial use of Rock and Dry Creek. To protect the cold and warm-water habitat beneficial use, this Order contains an Effluent Limitation based on the Basin Plan Water Quality Objective for pH.

32. Section III of the Basin Plan contains Water Quality Objectives for the Central Valley Region. The Pesticide Water Quality Objectives, on page III.6.00 of the Basin Plan, states "*Total identifiable **persistent chlorinated hydrocarbon pesticides** shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency* [U.S. EPA] *or the Executive Officer*." The Pesticide Water Quality Objective further states "*For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses*."

    The effluent monitoring results submitted by the Discharger (see Table 4 of the Information Sheet), reported the detection of several chlorinated hydrocarbon pesticides; 2,4-D, DDE, Dalapon, Dinoseb, Endosulfan I and Endosulfan II, Heptachlor Epoxide, and 2,4,5-TP. 2,4-D was reported by the laboratory to be in two of six samples at estimated concentrations of 0.45 and 0.69 µg/l. DDE was detected in one of five samples at a concentration of 0.058 µg/l, which also exceeded the CTR Criteria for the protection of Human Health of 0.00059 µg/l. Dalapon was reported by the laboratory to be in two of six samples; one at a concentration of 13 µg/l and the other at an estimated concentration of 1.1 µg/l. Endosulfan I and Endosulfan II were detected in one of five samples at concentrations of 0.10 and 1.2 µg/l, respectively. The concentrations of Endosulfan also exceeded the CTR Freshwater Aquatic Life criteria of 0.056 µg/l as a 4-Day Average and 0.22 µg/l as an Instantaneous Maximum. Heptachlor Epoxide was detected in one of five samples at a concentration of 0.086 µg/l, which also exceeds the CTR Human Health Criterion of 0.0001 µg/l. 2,4,5-TP was reported by the laboratory to be in two of six samples at estimated concentrations of 0.077 and 0.62 µg/l.

    The presence of these pesticides in the effluent presents a reasonable potential to exceed the Basin Plan Water Quality Objective for Pesticides. To protect the aquatic beneficial uses of the receiving water, a concentration-based Effluent Limitation for Persistent Chlorinated Hydrocarbon Pesticides, based on the Basin Water Quality Objective for Pesticides, is included in this Order: not detectable within the accuracy of analytical methods approved by the U.S. EPA or the Executive Officer.

    These limitations are at least as protective as the U.S. EPA CTR Human Health Criteria for DDE and Heptachlor Epoxide and the CTR Aquatic Life Criteria for Endosulfan.

33. **Settleable Solids** are those that will settle to the bottom of a cone-shaped container (called an Imhoff Cone) in a 60-minute period. Typical composition of untreated domestic wastewater includes concentrations of Settleable Solids, ranging from weak at 5 ml/l to strong at 15 ml/l. After treatment Settleable Solids concentrations should be significantly reduced. Measurement of Settleable Solids is constrained by the capability of the Imhoff Cone itself, which cannot measure concentrations below 0.1 ml/l. Consequently, the previous Order and this Order contain Effluent

Limitations for Settleable Solids at 0.1 ml/l as a 30-Day Average and 0.2 ml/l as a Daily Maximum.

34. The Basin Plan narrative **Toxicity** Water Quality Objective, on Page III-8.00, states: "all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life". This Order does not allow dilution within the receiving stream. The previous Order and this Order contain an Effluent Limitation that requires that the survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than 70% for any one bioassay and 90% for the median of three or more consecutive bioassays. This Order and the corresponding Monitoring and Reporting Program also prescribe chronic toxicity monitoring and reporting protocols.

35. **Aluminum** can be toxic to aquatic organisms. Based on information submitted by the Discharger, Polyaluminum Hydroxychloride may be used as a coagulant before the wastewater flows to the gravity filters. The use of this coagulant increases the reasonable potential for the discharge of elevated concentrations of Aluminum to cause or contribute to an in-stream excursion above the Basin Plan prohibition against the discharge of toxic constituents in toxic concentrations. The low pH and the low hardness cited in the U.S. EPA ambient criteria document exist here and are applicable to the discharge. The elevated concentrations of aluminum in the wastewater discharge present a reasonable potential to cause aquatic toxicity. The Basin Plan contains a narrative objective prohibiting the discharge of toxic constituents that cause toxicity within the receiving stream. With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA's published water quality criteria. [(40 CFR 122.44(d)(1)(vi)(A), (B), or (C)]. In this case, it is appropriate to use U.S. EPA's water quality criteria. U.S. EPA's ambient water quality criteria for aluminum are applicable to the discharge. The wastewater effluent has been measured at a low pH of 6.8, and the receiving stream hardness has been measured as low as 20 mg/l, which is directly applicable to the criteria. EPA recommends application of the criteria as necessary to protect aquatic life absent a site-specific limitation. The limitation for aluminum is reasonable and necessary to prevent aquatic toxicity from the wastewater discharge.

For Aluminum, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended Acute or Maximum Concentration (1-Hour Average) for Aluminum is 750 µg/l and the Chronic or Continuous Concentration (4-Day Average) is 87 µg/l, (both expressed as Total Recoverable Aluminum). U.S. EPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. In personal communications U.S. EPA water quality staff stated that at low hardness and pH, as is observed from the Dischargers WWTP, the acute and chronic values recommended in the ambient criteria document for aluminum are necessary to protect aquatic life.

Effluent monitoring results submitted by the Discharger (see Table 1 of the Information Sheet) indicated the presence of Total Recoverable Aluminum, in twelve samples, at concentrations of 11.8, 12.8, 25.1, 27.2, 27.4, 28.7, 37.7, 59.0, 61.0, 256, 274, and 404 µg/l. The three highest

concentrations were above the Chronic Criteria. New Effluent Limitations for Aluminum have been included in this Order to protect the receiving stream aquatic life beneficial uses based on U.S. EPA's recommended aquatic criteria, and have been established at the Ambient Water Quality Criteria for Aluminum.

36. Untreated domestic wastewater contains **ammonia**. Nitrification is a biological process that converts Ammonia to Nitrate, and denitrification is a process that converts Nitrate to Nitrogen Gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove Ammonia and nitrate from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of Ammonia or Nitrate to the receiving stream.

    U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, for total ammonia, include acute (1-Hour Average) standards based on pH and chronic (30-Day Average) standards based on pH and temperature. In addition, U.S. EPA specified that the highest 4-Day Average within a 30-Day period shall not exceed 2.5 times the chronic criteria. U.S. EPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia is not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. U.S. EPA has presented the Acute Ammonia Criteria in three ways: as equations, in a table, and in graphs that relate pH to ammonia concentrations. Attachment C shows the Acute Criteria when salmonids are present. The Chronic Criteria have been presented in a table shown in Attachments D and E.

    The existing Order contains a Receiving Water Limitation for un-ionized Ammonia, that requires that the discharge shall not cause Ammonia in the receiving water to exceed 0.025 mg/l as Nitrogen. The WWTP has had numerous violations of the Receiving Water Limitation. Effluent monitoring results submitted by the Discharger indicate that the concentration of Ammonia in the effluent has exceeded the U.S. EPA Ambient Water Quality Chronic Criteria for Ammonia on numerous occasions.

    The Code of Federal Regulations, 40 CFR 122.44(d)(iii), states that when a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above allowable numeric criteria for an individual pollutant, the NPDES permit must contain an Effluent Limitation. Therefore, this Order contains Effluent Limitations for ammonia based on the Ambient Water Quality Criteria represented in Attachments C, D, and E. The Discharger must calculate and report the 1-Hour Average using Attachment C, the 4-Day Average using Attachment D, and 30-day average using Attachment E. Failure to operate the wastewater treatment plant in a nitrification/denitrification mode will result in excessive concentrations of ammonia and nitrate being discharged and degrade the beneficial uses of the receiving stream.

    Despite numerous projects over several years, the Discharger has failed to comply with Waste Discharge Requirement limitations and to adequately nitrify the wastewater to achieve compliance

with ammonia limitations. The ammonia limitation, and the corresponding compliance monitoring, was established as a Receiving Water Limitation in existing Waste Discharge Requirements, not an Effluent Limitation as is appropriate. The Discharger has purchased water, which has been diverted down the receiving stream in an effort to provide dilution in an attempt to comply with the Receiving Water Limitation for ammonia following failed efforts at achieving adequate nitrification of the wastestream. The Regional Board issued Administrative Civil Liability Order No. 96-086 (ACLO) and Cease and Desist Order No. 96-087 (CDO) in 1996 for violations of previous Waste Discharge Requirements Order No. 92-116. The Discharger was required to pay $25,000 immediately and an additional $25,000 should the Discharger fail to comply with the CDO. A principal component of the water quality problems were due to the ongoing discharge of unacceptably high concentrations of ammonia. The Discharger paid the initial $25,000 and made improvements to the collection system and treatment facilities. However, the new facilities failed to comply completely with the CDO and permit limitations and prohibitions. The Discharger paid the second $25,000 on 4 February 2000 and has recently completed additional plant improvements. A Notice of Violation (NOV) was issued on 13 September 2000 for 25 total effluent limitation violations, including 12 ammonia violations. An NOV was issued on 12 July 2001, for the period August 2000 through April 2001, including receiving water ammonia violations on 16 occasions. Between May 2001 and September 2003, there have been additional violations of the Effluent and Receiving Water Limitations and reporting requirements of Order 97-113, including 31 violations of the Receiving Water Limitation for Ammonia. The receiving water ammonia sampling is not capable of providing sufficient information to determine if the most recently completed project will provide nitrification sufficient to comply with the ammonia Effluent Limitation. The Discharger claims the system is now capable of adequately nitrifying the waste stream.

37. For **Atrazine**, a triazine pesticide (not a chlorinated hydrocarbon), the U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended Instantaneous Maximum Concentration is 1.0 µg/l. Monitoring results submitted by the Discharger indicated the presence of Atrazine, in one of five samples, at a concentration of 2.0 µg/l, which is above the level necessary to protect freshwater aquatic life. To protect the receiving stream aquatic life beneficial uses, a new concentration-based Effluent Limitation for Atrazine, based on the Ambient Water Quality Criterion, to implement the Basin Plan narrative toxicity objective is included in this Order.

38. **Chlorine** is commonly used as a disinfection agent in the treatment of wastewater. The Discharger currently uses Chlorine for disinfection at the WWTP. For dechlorination, the Discharger currently uses Sulfur Dioxide, which combines with Chlorine, to render it relatively unreactive and thus remove it from the waste stream. Inadequate dechlorination may result in the discharge of Chlorine to the receiving stream. Chlorine is a toxic substance. The use of Chlorine as a disinfectant presents a reasonable potential that it could be discharged to the receiving stream in toxic concentrations.

Chlorine can cause toxicity to aquatic organisms when discharged to surface waters. For Chlorine, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The Recommended Maximum Concentration (1-Hour Average) for Chlorine is 0.019 mg/l and the Chronic (4-Day Average) is 0.011 mg/l. Rounded off, the limits are 0.02 mg/l and 0.01 mg/l, respectively.

The previous Order contained only an Effluent Limitation for Chlorine Residual of 0.02 mg/l as a Daily Maximum. To be protective of aquatic life beneficial uses, the Effluent Limitations must correspond to the both acute and chronic criteria. Concentration-based Effluent Limitations for Chlorine Residual have been included in this Order to implement the Basin Plan narrative toxicity objective and protect the receiving stream aquatic life beneficial uses and have been established at the Ambient Water Quality Criteria for Chlorine. This Order contains the same Daily Maximum Limitation as the existing Order, 0.02 mg/l expressed as a 1-Hour Average, but also contains a new Effluent Limitation of 0.01 mg/l as a 4-Day Average. It is not practible to convert the effluent limitations to daily maximum and monthly average limitations. The use of continuous recording sampling devises makes the limitation time frames appropriate. The existing dechlorination system is capable of adequately removing chlorine and therefore, a compliance schedule has not been included.

39. **Phthalate acid esters (PAEs)** represent a large family of chemicals widely used as plasticizers, primarily in the production of polyvinyl chloride (PVC) resins. PVC resins are used in such diverse industries as construction, home furnishings, transportation, apparel, and food and medical packaging materials. Phthalates also have non-plasticizer uses in pesticide carriers, cosmetics, fragrances, munitions, industrial oils, and insect repellants. The most widely used phthalate plasticizer is Bis(2-ethylhexyl)phthalate. Other PAEs include Dioctyl phthalates, Butyl benzyl phthalate (BBP), Diisodecyl phthalate, Dibutyl phthalate (DBP), Diethyl phthalate (DEP), Dimethyl phthalate (DMP), Di-tridecyl phthalate, and n-Hexyl n-decyl phthalate.

    In the Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, U.S. EPA has published Toxicity Information on the Chronic Lowest Observed Effect Level for the sum of the PAEs of 3 µg/l. For Bis(2-ethylhexyl)phthalate, individually, the U.S. EPA CTR Criterion to protect Human Health (30-Day average) for Drinking Water Sources (consumption of water and aquatic organisms) is 1.8 µg/l.

    In the monitoring results submitted by the Discharger (see Table 3 of the Information Sheet), the laboratory reported the presence of Bis(2-ethylhexyl)phthalate in two of five samples, at estimated concentrations of 1.7 and 2.93 µg/l, Diethyl phthalate in one of five samples, at a concentration of 4.57 µg/l, and Di-n-butyl phthalate in one of five samples, at an estimated concentration of 1.0 µg/l. The Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l and the Diethyl phthalate concentration of 4.57 µg/l were detected in the same sample. The sum of the two PAEs exceeds the Chronic Lowest Observed Effect Level for PAEs of 3 µg/l. The estimated Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l also exceeds the CTR Criterion of 1.8 µg/l. Individual Effluent Limitations for Bis(2-ethylhexyl)phthalate are discussed below.

To protect the aquatic habitat beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for the sum of the PAEs, based on the Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, U.S. EPA Toxicity Information on the Chronic Lowest Observed Effect Level for PAEs of 3 µg/l (as a 30-Day Average), is included in this Order.

40. **Tributyltin (TBT)** in this area is primarily used as a biocide in cooling towers and as an antifouling agent in paints. TBT remains effective over long periods because it is released slowly into the water column over time. For Tributyltin, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The Recommended Maximum Concentration (1-Hour Average) for Tributyltin is 0.46 µg/l and the Chronic (4-Day Average) is 0.072 µg/l. Monitoring results submitted by the Discharger (see Table 6 of the Information Sheet) indicated the presence of Tributyltin in three of twelve samples, at concentrations of 0.006, 0.008, and 0.066 µg/l. The projected maximum concentration of Tributyltin exceeded the Chronic Criteria (0.072 µg/l). To implement the Basin Plan narrative toxicity objective and protect the aquatic beneficial uses of the receiving water, concentration-based Effluent Limitations for Tributyltin, based on the Ambient Water Quality Criteria, are included in this Order.

41. **Alachlor, Nitrate, and Nitrite, and Manganese and MTBE**
DHS has adopted Primary Maximum Contaminant Levels (PMCLs) in Title 22 for Alachlor, Nitrate, and Nitrite, and Secondary MCLs for Manganese and MTBE. To implement the Basin Plan Narrative Chemical Constituent Objective and protect the municipal and domestic supply beneficial use of the receiving water, Effluent Limitations for Alachlor, Nitrate, and Nitrite, Manganese and MTBE are included in this Order as described below:

a. Alachlor
For Alachlor, the U.S. EPA and subsequently DHS have developed a PMCL of 2 µg/l. Monitoring results submitted by the Discharger (see Table 4 of the Information Sheet) indicated the presence of Alachlor, an herbicide, in one of five samples, at a concentration of 3.2 µg/l, which is above the PMCL. A new concentration-based Effluent Limitation for Alachlor based on the PMCL is included in this Order.

b. Nitrate
Untreated domestic wastewater contains Ammonia. Nitrification is a biological process that converts Ammonia to Nitrate, and denitrification is a process that converts Nitrate to Nitrogen Gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove Ammonia from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of Ammonia or Nitrate to the receiving stream. The Discharger's WWTP does not include denitrification as a unit process, increasing the probability that Nitrate may be discharged to the receiving stream.

The U.S. EPA and subsequently DHS, have developed a PMCL of 10,000 µg/l (10.0 mg/l) for total Nitrate plus Nitrite (as N). Recent toxicity studies have also indicated a possibility that Nitrate is toxic to aquatic organisms. The conversion of Ammonia to Nitrate presents a reasonable potential for the discharge to exceed the PMCL for Nitrate. Effluent monitoring results submitted by the Discharger (see Table 6 of the Information Sheet) indicated the presence of Nitrate (as N), in twelve samples, at concentrations of 2.7, 6.3, 6.8, 7.0, 7.5, 7.8, 12, 13, 13, 13, 17, and 22 mg/l and Nitrite (as N) in three of twelve samples at 0.22, 0.28, and 0.37 mg/l. The six highest reported concentrations of Nitrate alone exceeded the PMCL. This sampling was conducted prior to the system being capable of operating regularly in a nitrification mode when the nitrogen may have been in the ammonia form. With the capability to nitrify the wastestream, the nitrate levels will increase.

This Order includes a new concentration-based Effluent Limitation for total Nitrate plus Nitrite (as N) based on the PMCL.

c. Nitrite

For Nitrite, the U.S. EPA and subsequently DHS have developed a PMCL of 1,000 µg/l (1 mg/l). Effluent monitoring results submitted by the Discharger (see Table 6 of the Information Sheet) indicated the presence of Nitrite, in three of twelve samples, at concentrations of 0.22, 0.28 and 0.37 mg/l.

While none of the concentrations exceeded the PMCL, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined in the attached Information Sheet.) The Reasonable Potential Analysis indicated that there is a statistical probability for Nitrite in the effluent to exceed the PMCL.

The Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the PMCL for Nitrite. Therefore, a new concentration-based Effluent Limitation for Nitrite, based on the PMCL, is included in this Order.

d. Manganese

For Manganese, the U.S. EPA and DHS have developed an SMCL of 50 µg/l (0.050 mg/l). Effluent monitoring results submitted by the Discharger (see Table 1 of the Information Sheet) indicated the presence of total recoverable Manganese, in twelve samples, at concentrations of 14.4, 21.1, 24.6, 26.2, 32.1, 32.9, 33.7, 35.3, 40.0, 43.6, 48.7, and 55.0 µg/l. The highest reported Manganese concentration exceeded the SMCL. Therefore, a new concentration-based Effluent Limitation for Manganese, based on the SMCL, is included in this Order.

e. MTBE (Methyl tert Butyl Ether)

For MTBE, DHS has developed an SMCL of 5 µg/l (0.005 mg/l). Effluent monitoring results submitted by the Discharger (see Table 2 of the Information Sheet) indicated the presence of MTBE (a gasoline additive), in seven of twelve samples, at concentrations of 0.21, 0.22, 0.40, 0.47, 0.81, 1.2, and 3.8 µg/l.

While none of the concentrations exceeded the PMCL, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined in the attached Information Sheet.) The Reasonable Potential Analysis indicated that there is a statistical probability for MTBE in the effluent to exceed the SMCL.

The Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the SMCL for MTBE. Therefore, a new concentration-based Effluent Limitation for MTBE, based on the SMCL, is included in this Order.

42. **Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc**

The U.S. EPA adopted the NTR and the CTR that contain numerical water quality standards for many wastewater constituents. Additional explanation of the NTR and CTR is provided in Findings above. The SIP, adopted by the State Water Resources Control Board, contains guidance on implementation of the NTR and the CTR. These Rules contain water quality standards applicable to this discharge. Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc based on the NTR and CTR are described below.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB* [Regional Water Quality Control Board] *may establish a compliance schedule in an NPDES permit.*" Section 2.1 states further that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: "*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable."* This Order requires the Discharger to provide this information. If justification for compliance schedules is **not** completed and submitted by the Discharger to the Regional Board, or the justification is not adequate per Section 2.1 of the SIP, the new water quality based Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc become effective on **1 July 2004**. If compliance schedules are justified and

implemented, then the final water quality based Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc become effective **30 January 2009**. This Order contains a Provision with a compliance schedule for implementation of final Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc.

If compliance schedules are granted for implementation of final Effluent Limitations for CTR and NTR constituents, Section 2.2.1 of the SIP requires the Regional Board to establish interim limitations and compliance dates in the NPDES permit. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with interim Effluent Limitations, can significantly degrade water quality and adversely impact the beneficial uses of the receiving stream on a long-term basis. For example, regarding Copper, U.S. EPA states in the Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life, that an unstressed system will take approximately three years to recover from a pollutant in which exposure to copper exceeds the recommended criterion. However, the interim Effluent Limitations establish enforceable ceiling concentrations until compliance with the final Effluent Limitations can be achieved.

The SIP requires that interim limitations must: 1) be based on current treatment plant performance or existing permit limitations, whichever is more stringent; 2) include interim compliance dates separated by no more than one year; and 3) be include in the Provisions. There are no limitations for CTR and NTR constituents in the existing Order. Therefore, the interim limitations in this Order are based on the current treatment plant performance.

To develop interim Effluent Limitations:

- Procedures for deriving water quality-based limits are outlined in U.S. EPA's *Technical Support Document for Water Quality Based Toxics Control,* EPA/505/2-90-001 (TSD). Table 5-2 of the TSD contains multipliers to be used in establishing maximum daily limits based on a long-term average objective and the Coefficient of Variation (C_V) for the data set.

- When there are ten or more sampling data points, the variability in sampling and the laboratory is accounted for by establishing interim Effluent Limitations based on normally distributed data, where 99.9% of the data points lie within 3.3 standard deviations from the mean (*Basic Statistical Methods for Engineers and Scientists*, Kennedy and Neville, Harper and Row). In this case, once the C_V is calculated, the appropriate multiplier can be selected from Table 5.2. Where actual sampling shows an exceedance of the proposed 3.3 standard deviation based interim Effluent Limitation, the maximum detected concentration is established as the interim Effluent Limitation.

- The TSD acknowledges that a minimum of ten data points is necessary to conduct a statistical analysis based on normally distributed data. When less than ten data points are

available, the TSD recommends use of a C_V of 0.6 to represent wastewater effluent sampling. In this case, the long-term average objective is to maintain, at a minimum, the current performance level of the treatment plant. With $C_V = 0.6$ and with a 99th Percentile occurrence probability, Table 5.2 provides a multiplier of 3.11.

The interim Effluent Limitation is established by multiplying the maximum concentration of the observed sample points by the appropriate multiplier.

In addition, the NPDES regulations, at 40 CFR 122.45(d) and reiterated in the SIP for CTR constituents, require that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for POTWs. In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted into an Average Monthly Effluent Limitation (AMEL) and Maximum Daily Effluent Limitation (MDEL). The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, and is shown in the Information Sheet.

The Regional Board finds that the Discharger can undertake source control and treatment plant operational measures to maintain compliance with the interim limitations included in this Order. This Order contains a Provision with interim compliance dates, and interim Effluent Limitations, based on the current treatment plant performance, for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc.

a. **Bis(2-ethylhexyl)phthalate (also known as Di(2-ethylhexyl)phthalate)**
For Bis(2-ethylhexyl)phthalate, the CTR Human Health Criterion (30-Day average) (consumption of water and aquatic organisms) is 1.8 µg/l. Effluent monitoring results submitted by the Discharger (see Table 3 of the Information Sheet) indicated detectable concentrations of Bis(2-ethylhexyl)phthalate, in two of five samples. The concentrations were estimated by the analyzing laboratory to be 1.7 and 2.93 µg/l. The highest estimated concentration of Bis(2-ethylhexyl)phthalate in the effluent exceeded the CTR criterion. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Bis(2-ethylhexyl)phthalate, based on the CTR Criterion, is included in this Order.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Bis(2-ethylhexyl)phthalate, then an interim Daily Maximum Effluent Limitation for Bis(2-ethylhexyl)phthalate is calculated using the procedure outlined in the Information Sheet is 9.1 µg/l.

b. **Bromodichloromethane**
The CTR Human Health Criterion for Bromodichloromethane (30-Day average) (consumption of water and aquatic organisms) is 0.56 µg/l. Effluent monitoring results submitted by the Discharger (see Table 2 of the Information Sheet), contained concentrations

of Bromodichloromethane, in ten of twelve samples, at 0.50, 0.60, 0.61, 0.63, 0.64, 0.66, 0.69, 0.71, 1.2, and 1.5 µg/l. Nine of the reported concentrations exceed the CTR criterion for Bromodichloromethane. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Bromodichloromethane, based on the CTR Criterion, is included in this Order.

Bromodichloromethane, Bromoform, Chloroform, and Dibromochloromethane are collectively known as Total Trihalomethanes. U.S. EPA has established a PMCL for Total Trihalomethanes of 80 µg/l. Bromodichloromethane, Chloroform, and Dibromochloromethane were detected in the effluent from SMD1. Bromoform was not detected. The sums of the concentrations of Bromodichloromethane, Chloroform and Dibromochloromethane do not exceed the PMCL and had no reasonable potential to do so. The Effluent Limitations for Chloroform and Bromodichloromethane are protective of the drinking water beneficial uses and below the PMCL. Chloroform was detected at concentrations that exceeded OEHHA Criteria and is discussed below. The concentration of Dibromochloromethane did not exceed the water quality criteria, therefore, effluent limitations for Dibromochloromethane are not proposed.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Bromodichloromethane, then an interim Daily Maximum Effluent Limitation for Bromodichloromethane is calculated using the procedure outlined in the Information Sheet is 5.48 µg/l.

c. **Copper**

The toxicity of Copper to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Copper to aquatic life increases. The CTR Freshwater Aquatic Life Copper Criteria are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Copper Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for both the Acute and Chronic Copper Criteria is: CF = 0.96.

Effluent monitoring data submitted by the Discharger (see Table 1 of the Information Sheet) contained concentrations of dissolved Copper in twelve samples, at 0.82, 0.88, 1.08, 1.18, 1.48, 1.49, 1.87, 1.90, 1.96, 2.11, 2.47, and 2.57 µg/l, and concentrations of total recoverable Copper, in twelve samples, at 0.88, 0.92, 1.07, 1.49, 1.52, 1.52, 1.78, 1.97, 2.05, 2.22, 2.68, and 2.93 µg/l.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Copper fraction) are calculated to be 5.9 µg/l and 8.4 µg/l, respectively. Similarly, the Chronic and

Acute Criteria (expressed as the total recoverable Copper fraction) are calculated to be 6.1 µg/l and 8.8 µg/l. None of the Copper concentrations exceeded the Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Copper concentrations in the effluent alone do not create toxic conditions.

Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Copper fraction) are calculated to be 2.3 µg/l and 2.9 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Copper fraction) are calculated to be 2.4 µg/l and 3.1 µg/l. With a receiving water hardness of 20 mg/l, the two highest reported concentrations of Copper (dissolved fraction) exceed the Chronic Criteria (2.3 µg/l) and the two highest reported concentrations of Copper (total recoverable fraction) exceed the Chronic Criteria (2.4 µg/l), presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Copper. Effluent Limitations are necessary.

While the Copper Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Copper. (The conversion factor for Copper is discussed above.) Therefore, the calculations to determine the Copper Effluent Limitations were restricted to the data expressed as total recoverable Copper.

The Table and equations, shown in Attachment F of the Information Sheet, represent the Acute and Chronic hardness-dependent Copper Criteria as Total Recoverable Copper. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Copper concentrations using the Table and/or the equations shown in Attachment F, and the effluent Copper and R2 hardness data collected according to the attached Monitoring and Reporting Program.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Copper, then the interim Daily Maximum Effluent Limitation for Copper, calculated using the procedure outlined in the Information Sheet, is 6.33 µg/l

d. **Dioxins (and Furans)**

The toxic effects of 2,3,7,8-TCDD (Tetrachlorodobenzo-p-dioxin) commonly known as Dioxin, have been well documented. The many congeners (variations) of the Chlorinated Dibenzodioxins (Dioxins) and Chlorinated Dibenzofurans (Furans) exhibit toxic effects similar to those of 2,3,7,8-TCDD. The U.S. EPA has published Toxic Equivalency Factors (TEFs) for 17 of the congeners. The TEFs are shown in the SIP and the attached Information Sheet. The TEFs express the relative toxicities of the congeners compared to 2,3,7,8-TCDD, which has a TEF equal to 1.0.

For the Dioxins and Furans, the CTR Criterion to protect Human Health criterion (30-Day Average)(consumption of water and aquatic organisms) is 0.000000013 µg/l (1.3×10^{-8} µg/l

or 1.3 x 10^{-14} g/l). The criterion applies to the sum of the concentrations of 2,3,7,8-TCDD plus each of the congeners, after translation with the respective TEFs.

The Discharger collected five samples and had them analyzed for 2,3,7,8-TCDD and the congeners. Effluent monitoring results submitted by the Discharger (see Table 5 of the Information Sheet) contained a concentration of 2,3,7,8-TCDD in one of the five samples at 3.33 pg/l (3.33 x 10^{-12} g/l or 3.33 x 10^{-6} µg/l, where pg/l = picograms/liter = 10^{-12} g/l and 10^{-6} µg/l).

Two of the Dioxin and Furan congeners, OCDD (Octa Chlorinated Dibenzodioxin) and OCDF (Octa Chlorinated Dibenzofuran), were also detected in the effluent from SMD1. OCDD was detected in three of the five samples; after translation, the concentrations of OCDD were 0.000979, 0.00102, and 0.00228 pg/l (9.79 x 10^{-16}, 1.02 x 10^{-15}, and 2.28 x 10^{-15} g/l). OCDF was detected in one of the five samples; after translation, OCDF was reported at a concentration of and 0.000951 pg/l (9.51 x 10^{-16} g/l). The OCDD concentration of 0.00228 pg/l and OCDF concentration of 0.000951 pg/l were detected in the same sample.

The sample with the reported concentration of 2,3,7,8-TCDD (3.33 x 10^{-12} g/l), which was also the sum of the congeners in the sample, exceeds the CTR criterion (1.3 x 10^{-14} g/l). The sums of the concentrations of OCDD and OCDF in the other samples did not exceed the criterion. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Dioxins and Furans, based on the CTR Criterion, is included in this Order.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Dioxins and Furans, then an interim Daily Maximum Effluent Limitation for Dioxins and Furans is calculated using the procedure outlined in the Information Sheet, is 10.36 pg/l.

e. **Lead**

The toxicity of Lead to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Lead to aquatic life increases. The CTR Freshwater Aquatic Life Lead Criteria are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Lead Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for both the Acute and Chronic Lead Criteria is: $CF = 1.46203 - \{[\ln(\text{hardness})](0.145712)\}$.

Effluent monitoring data submitted by the Discharger (see Table 1 of the Information Sheet) contained concentrations of dissolved Lead, in twelve samples, at 0.041, 0.368, 0.424, 0.513, 0.558, 0.567, 0.591, 0.750, 0.926, 1.008, 1.21, and 1.51 µg/l, and concentrations of total recoverable Lead, in twelve samples, at 0.130, 0.387, 0.430, 0.539, 0.549, 0.585, 0.602, 0.772, 0.996, 1.046, 1.260, and 1.490 µg/l.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Lead fraction) are calculated to be 1.46 µg/l and 37.56 µg/l, respectively. The highest reported dissolved Lead concentration **exceeded** the Chronic Criterion for dissolved Lead. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Lead fraction) are calculated to be 1.70 µg/l and 43.52 µg/l. None of the total recoverable Lead concentrations exceeded the Lead Criteria calculated with a hardness of 61 mg/l. However, the highest reported dissolved Lead concentration exceeded the Acute Criterion for dissolved Lead, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Lead.

Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Lead fraction) are calculated to be 0.42 µg/l and 10.79 µg/l, respectively. The ten highest reported dissolved Lead concentrations exceeded the Chronic Criterion. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Lead fraction) are calculated to be 0.41 µg/l and 10.52 µg/l, respectively. The ten highest reported total recoverable Lead concentrations exceeded the Chronic Criterion. With a receiving water hardness of 20 mg/l, the majority of the reported concentrations of dissolved and total recoverable Lead exceeded the Chronic Criteria, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Lead. Effluent Limitations are necessary.

While the Lead Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Lead. (The conversion factor for Lead is discussed above.) Therefore, the calculations to determine the Lead Effluent Limitations were restricted to the data expressed as total recoverable Lead.

The Table and equations shown in Attachment G of the Information Sheet represent the Acute and Chronic hardness-dependent Lead Criteria as Total Recoverable Lead. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Lead concentrations using the Table and/or the equations shown in Attachment G, and the effluent Lead and R2 hardness data collected according to the attached Monitoring and Reporting Program.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Lead, then the interim Daily Maximum Effluent Limitation for Lead may be calculated using the procedure outlined in the Information Sheet, is 4.25 µg/l.

f. **PCBs (Polychlorinated Biphenyls)**

PCBs are chlorinated biphenyls (two joined benzene rings) and were manufactured for use primarily in closed electrical systems. PCBs were marketed in several mixtures under the

registered trademark Aroclor. The CTR PCB Human Health Criterion (30-Day average) (consumption of water and aquatic organisms) is 0.00017 µg/l and applies to the sum of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260. The CTR Freshwater Aquatic Life Criterion, Continuous Concentration (4-Day Average) is 0.014 µg/l and applies to each Aroclor, individually.

Effluent monitoring results submitted by the Discharger (see Table 4 of the Information Sheet) contained concentrations of three PCB mixtures marketed as Aroclor 1016, Aroclor 1221, and Aroclor 1260 in two of five samples. Aroclor 1016 was estimated by the laboratory to be present at a concentration of 0.26 µg/l, Aroclor 1221 was detected at a concentration of 5.7 µg/l, and Aroclor 1260 was reported by the laboratory to be present at a concentration of 0.078 µg/l. Aroclors 1016 and 1260 were reported in the same sample. All three concentrations exceed both the CTR Human Health and Aquatic Life Criteria. The concentration of 5.7 µg/l was the highest sum of the Aroclors detected.

The detection of Aroclor 1221 and estimated concentrations of Aroclors 1016 and 1260 represent a reasonable potential to cause or contribute to an in-stream excursion above the CTR Criteria for PCBs, individually, and in total.

To protect the drinking water beneficial use of the receiving waters, a new concentration-based final Effluent Limitation for the sum of all the Aroclors based on the CTR Criterion, is included in this Order (0.00017 µg/l).

Also to protect the habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for the individual PCBs, Aroclor 1016, Aroclor 1221, and Aroclor 1260, based on the CTR Aquatic Life Criterion (0.014 µg/l as a 4-Day Average), are also included in this Order. The NPDES regulations at 40 CFR 122.45(d) require that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for POTWs. In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted into an Average Monthly Effluent Limitation (AMEL) and Maximum Daily Effluent Limitation (MDEL). The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP and is shown in the Information Sheet. The AMEL for each of the individual Aroclors is 0.0114 µg/l and the MDEL for each Aroclor is 0.0230 µg/l.

If a compliance schedule is granted for implementation of the final Effluent Limitations for the sum of the Aroclors and the individual Aroclors 1016, 1221, and 1260, then interim Daily Maximum Effluent Limitations for the sum of the Aroclors and the individual Aroclors 1016, 1221, and 1260 are calculated using the procedure outlined in the Information Sheet. The interim Daily Maximum Effluent Limitation for both the sum of the Aroclors and Aroclor 1221 is 17.73 µg/l. The interim Daily Maximum Effluent Limitation for Aroclor 1016 is 0.81 µg/l and for Aroclor 1260 is 0.24 µg/l.

g. **Silver**

The toxicity of Silver to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Silver to aquatic life increases. The CTR Freshwater Aquatic Life Silver Criteria are hardness-dependent and may be represented in tabular or graphic form, or by an equation. The Silver Criteria (expressed as dissolved metal) are presented as Acute or Instantaneous Maximum Concentrations (CMC or 1-Hour Average) with no Chronic Criteria. The CTR contains a conversion factor to translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for the Silver Criteria is: CF = 0.85.

Effluent monitoring data submitted by the Discharger (see Table 1 of the Information Sheet) contained concentrations of dissolved Silver, in five of twelve samples, at 0.002, 0.005, 0.017, 0.025, and 0.110 µg/l, and total recoverable Silver, in ten of twelve samples, at 0.020, 0.025, 0.027, 0.033, 0.034, 0.045, 0.065, 0.077, 0.095, and 0.431 µg/l.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Acute Criterion (expressed as the dissolved Silver fraction) is calculated to be 1.5 µg/l. Similarly, the Acute Criterion (expressed as the total recoverable silver fraction) is calculated to be 1.7 µg/l. None of the Silver concentrations exceeded the Criteria calculated using the effluent hardness of 61 mg/l; therefore, the hardness and silver concentrations in the effluent alone do not create toxic conditions.

Using the receiving water hardness of 20 mg/l and the equations shown above, the Acute Criterion (expressed as the dissolved Silver fraction) is calculated to be 0.22 µg/l. Similarly, the Acute Criterion (expressed as the total recoverable Silver fraction) is calculated to be 0.25 µg/l. With a receiving water hardness of 20 mg/l, the highest reported concentration of Silver (total recoverable fraction) exceeds the Acute Criterion (0.25 µg/l), presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Silver. Effluent Limitations are necessary.

While the Silver Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Silver. (The conversion factor for Silver is discussed above.) Therefore, the calculations to determine the Silver Effluent Limitations were restricted to the data expressed as total recoverable Silver.

The Table and equations shown in Attachment H represent the Instantaneous Maximum hardness-dependent Silver Criteria as Total Recoverable Silver. The Discharger must calculate the final Effluent Limitations for Instantaneous Maximum Silver concentrations using the Table and/or the equations shown in Attachment H, and the effluent Silver and R2 hardness data collected according to the attached Monitoring and Reporting Program.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Silver, then an interim Daily Maximum Effluent Limitation for Silver may be calculated using the procedure outlined in the Information Sheet, is 3.14 µg/l.

h. **Zinc**

The toxicity of Zinc to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Zinc to aquatic life increases. The CTR Freshwater Aquatic Life Zinc Criteria are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Zinc Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for the Acute Zinc Criteria is: CF = 0.978. The conversion factor, for the Chronic Zinc Criteria is: CF = 0.986.

Effluent monitoring data submitted by the Discharger (see Table 1 of the Information Sheet) contained concentrations of dissolved Zinc, in twelve samples, at 6.16, 25.2, 25.5, 26.4, 27.3, 27.8, 28.5, 28.8, 31.7, 33.5, 34.4, and 72.2 µg/l, and total recoverable Zinc, in twelve samples, at 7.40, 21.8, 26.2, 26.5, 26.8, 27.8, 28.7, 28.7, 29.2, 32.7, 33.6, and 34.5 µg/l.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Zinc fraction) are calculated to be 78 µg/l and 77 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Zinc fraction) are calculated to be 79 µg/l and 77 µg/l. None of the Zinc concentrations exceeded the Zinc Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Zinc concentrations in the effluent alone do not create toxic conditions.

Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Zinc fraction) are calculated to be 30 µg/l and 30 µg/l, respectively. The four highest reported dissolved Zinc concentrations **exceeded** the Acute and Chronic Criteria. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Zinc fraction) are calculated to be 31 µg/l and 30 µg/l, respectively. The three highest reported total recoverable Zinc concentrations **exceeded** the Acute and Chronic Criteria. With a receiving water hardness of 20 mg/l, several of the reported concentrations of dissolved and total recoverable Zinc exceeded the Acute and Chronic Criteria, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Zinc. Effluent Limitations are necessary.

While the Zinc Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Zinc. (The conversion factor for Zinc is discussed above.) Therefore, the calculations to determine the Zinc Effluent Limitations were restricted to the data expressed as total recoverable Zinc.

The Table and equations shown in Attachment I represent the Acute and Chronic hardness-dependent Lead Criteria as Total Recoverable Zinc. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Zinc concentrations using the Table and/or the equation shown in Attachment I, and the effluent Zinc and R2 hardness data collected according to the attached Monitoring and Reporting Program.

If a compliance schedule is granted for implementation of the final Effluent Limitations for Zinc, then an interim Daily Maximum Effluent Limitation for Zinc calculated using the procedure outlined in the Information Sheet, is 60.72 µg/l.

i. **Chloroform**

Effluent monitoring results submitted by the Discharger (see Table 2 of the Information Sheet) indicated the presence of Chloroform, in eleven of twelve samples, at concentrations of 3.5, 5.6, 5.8, 5.9, 6.5, 8.0, 8.4, 9.2, 9.7, 11, and again at 11 µg/l.

The California EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including Chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within California EPA. The OEHHA cancer potency value for oral exposure to Chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicological assumptions used by OEHHA and U.S. EPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/l (0.0011 mg/l) at the 1-in-a-million cancer risk level. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water.

The one-in-a-million cancer risk level is also mandated by U.S. EPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters. Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality standard for Chloroform. Therefore, an Effluent Limitation for Chloroform is included in this Order and is based on the Basin Plan toxicity objective and OEHHA Toxicity Criteria for the protection of human health (1.1 µg/l).

Bromodichloromethane, Bromoform, Chloroform, and Dibromochloromethane are collectively known as Total Trihalomethanes. U.S. EPA has established a PMCL for Total Trihalomethanes of 80 µg/l (the sum of the concentrations of the four constituents). Bromodichloromethane, Chloroform, and Dibromochloromethane were detected in the effluent from SMD1. Bromoform was not detected. The sums of the concentrations of Bromodichloromethane, Chloroform, and Dibromochloromethane do not exceed the PMCL. Individual Effluent Limitations for Chloroform and Bromodichloromethane in this Order are protective of the drinking water beneficial uses and below the PMCL. Bromodichloromethane was detected at concentrations that exceeded CTR Criteria, and is discussed above. The concentration of Dibromochloromethane did not exceed water quality criteria and no effluent limitations are proposed for Dibromochloromethane.

43. Mass-based final Effluent Limitations, in lbs/day, are also included in this Order, where practible, in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated as described in the Information Sheet and according to the design dry weather flow.

Receiving Water Limitations

44. The Clean Water Act, Section 303(a-c), required states to adopt numeric criteria where they are necessary to protect designated uses. The Regional Board adopted numeric objectives in the Basin Plan. The Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control (40 CFR 131.20). State Board Resolution No. 68-16, the Antidegradation Policy, does not allow changes in water quality that are below the level prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that; "The numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses." This Order contains Receiving Water Limitations based on the Basin Plan numerical and narrative water quality objectives for Biostimulatory Substances, Chemical Constituents, Color, Dissolved Oxygen, Floating Material, Oil and Grease, pH, Pesticides, Radioactivity, Salinity, Sediment, Settleable Material, Suspended Material, Tastes and Odors, Temperature, Toxicity and Turbidity.

45. Receiving Water Limitations are based on Basin Plan Water Quality Objectives. The Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above Basin Plan Water Quality Objectives for Dissolved Oxygen (DO), pH, Temperature, and Turbidity. The existing Order contains Receiving Water Limitations that are not in conformance with the Basin Plan and/or not protective of the beneficial uses of the receiving water. This Order contains Receiving Water Limitations for DO, pH, Temperature, and Turbidity that have been modified as described below:

a. Dissolved Oxygen (DO)

Existing Order No. 97-113 has a DO Receiving Water Limitation of 5 mg/l, which is the Basin Plan Water Quality Objective for warm-water fisheries. However, the Basin Plan contains a 7 mg/l DO Water Quality Objective for cold-water fisheries and for waters designated as suitable spawning habitat. As discussed above, the beneficial uses of Rock Creek, Dry Creek, and Coon Creek include cold water and spawning habitat beneficial uses. Therefore, this Order contains a Receiving Water Limitation of 7 mg/l for DO.

b. pH

Existing Order No. 97-113 has a pH Receiving Water Limitation that applies a 30-Day averaging period to the ambient pH, as follows:

> *"9. The 30-day average ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units."*

This Order contains a Receiving Water Limitation in which the 30-day averaging period is applied only to the change in pH, as follows:

> *"2. The ambient pH to fall below 6.5 or exceed 8.5, or the 30-day average ambient pH to change by more than 0.5 units."*

The Receiving Water Limitation in this Order is more protective of beneficial uses and in conformance with the Basin Plan Water Quality Objective for pH, "*The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5...*"

c. Temperature

Existing Order No. 97-113 has a temperature Receiving Water Limitation that applies a 30-day averaging period to the ambient temperature, as follows:

> *"11. The 30-day average ambient temperature to increase more than 5°F."*

This Order contains a Receiving Water Limitation that has no averaging period for temperature, as follows:

> *"3. The ambient temperature to increase more than 5°F."*

The Receiving Water Limitation in this Order is more protective of beneficial uses and in conformance with the Basin Plan Water Quality Objective for temperature "*At no time or place shall temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.*" The Discharger has not demonstrated that an averaging period for temperature is protective of beneficial uses.

d. Turbidity

Existing Order No. 97-113 contains the following Receiving Water Limitation:

"8. The 30-day average for turbidity to increase as follows:

a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

d. More than 10 percent where natural turbidity is greater than 100 NTUs."

This Order contains the following Receiving Water Limitation:

"4. The turbidity to increase as follows:

a. (The 30-day average turbidity to increase) More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

d. More than 10 percent where natural turbidity is greater than 100 NTUs."

The Receiving Water Limitation has been changed so that the 30-day average applies only to part a. and no longer applies to parts b., c., and d. A tertiary plant is able to meet the limitations in parts b., c., and d. without an averaging period. However, a tertiary plant is not able to meet the limitations of part a. without an averaging period. Therefore, the 30-day averaging period is only applied to part a. During high storm flows and inflow to the plant, the wastewater discharged from the plant will be more dilute and less turbid. In addition, during high storm flows, the Receiving Water will have a higher relative turbidity. Therefore, the Turbidity Effluent Limitations in this Order are protective of the Receiving Water Beneficial Uses.

Objectives/Study - EC And TDS

46. As described above, agriculture irrigation is a beneficial use of the receiving waters, Rock Creek, Dry Creek, and downstream waters. Domestic and industrial use of water, results in an increase in the mineral content of the wastewater. The minerals include calcium, sodium, sulfate, and other dissolved salts, including chloride. The salinity of wastewater is determined by measuring EC or TDS, which are parameters used to determine the suitability of wastewater for irrigation.

Monitoring results submitted by the Discharger indicated that concentrations of Electrical Conductivity (EC) and Total Dissolved Solids (TDS) exceeded Agriculture Irrigation Goals in the effluent. However, no data was submitted by the Discharger to indicate the Agriculture Irrigation Objectives were exceeded in the Receiving Water. This Order contains a Provision for a study to determine whether the discharge causes the EC and TDS to exceed the Agriculture Irrigation Goals in the Receiving Water. The Provision allows this Order to be reopened if new data indicate Effluent Limitations are necessary.

a. EC (Electrical Conductivity, also Specific Conductance)

To protect agricultural irrigation use, studies have recommended an Agricultural Water Quality Goal of 700 µmhos/cm, for EC. To protect the municipal and domestic supply use, the California Department of Health Services has recommended an SMCL for EC of 900 µmhos/cm, with an upper level of 1600 µmhos/cm, and a short-term level of 2200 µmhos/cm.

In the Basin Plan, Numeric Water Quality Objectives for the protection of beneficial uses have been established for EC in the Sacramento River, between the Colusa Basin Drain and the "I" Street Bridge and in the Feather River, from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Rock Creek is eventually tributary to the Feather River between the Fish Barrier Dam and the Sacramento River.

Effluent monitoring results submitted by the Discharger (see Table 6 of the Information Sheet) include reported concentrations of EC, in twelve samples, at 480, 580, 620, 630, 650, 650, 680, 690, 690, 730, 730, and 840 µmhos/cm. The effluent EC values do not exceed the SMCL and it appears there is assimilative capacity in the Sacramento and Feather Rivers for the dissolved salts, including EC, discharged from SMD1. The three effluent samples with the highest concentrations exceeded the Agriculture Water Quality Goal in the effluent.

However, the monitoring results submitted by the Discharger did not contain data for EC concentrations in the receiving water and it is not possible to determine whether the Agriculture Irrigation Goals were exceeded in the receiving water. Therefore, this Order contains a Provision for a study with compliance schedule to determine whether concentrations of EC in the receiving water exceed the agriculture irrigation goals. The Provision allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

b. TDS (Total Dissolved Solids)

The California Department of Health Services has recommended an SMCL for TDS of 500 mg/l. To protect the agricultural irrigation use, studies have recommended an Agricultural Water Quality Goal of 450 mg/l for TDS (lower than the SMCL). Effluent monitoring results submitted by the Discharger (see Table 6 of the Information Sheet)

include reported concentrations of TDS in twelve samples, at 240, 310, 330, 330, 340, 340, 340, 360, 360, 360, 370, and 400 mg/l.

While none of the concentrations exceeded the goal for agricultural use, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control*. (The steps of the Reasonable Potential Analysis are outlined in the attached Information Sheet.) The Reasonable Potential analysis indicates a statistical probability for TDS to exceed the Agriculture Irrigation goal in the effluent.

However, the monitoring results submitted by the Discharger did not contain data for TDS concentrations in the receiving water and it is not possible to determine whether the Agriculture Irrigation Goals were exceeded in the receiving water. Therefore, this Order contains a Provision for a study with compliance schedule to determine whether concentrations of TDS in the receiving water exceed the agriculture irrigation goals. The Provision allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

Analytical Reporting Limits Higher Than Criteria Concentrations/ Detected Concentration Just Below Criterion

47. A substantial number of constituents including Volatile Organics, Semi-Volatile Organics, Inorganics, and Pesticides and PCB's were not analyzed at or below the criterion concentration by commercial laboratories. Therefore, reasonable potential cannot be determined accurately at this time for the following constituents:

CONSTITUENTS ANALYZED ABOVE CRITERIA

VOLATILE ORGANICS	***SEMI VOLATILE ORGANICS***	***PESTICIDES - PCBS***
1,1-Dichloroethene	1,2-Benzanthracene	4,4-DDD
1,1,2,2-Tetrachloroethane	1,2-Diphenylhydrazine	4,4-DDE
1,2-Dichloroethane	2-Chlorophenol	4,4-DDT
Acrylonitrile	2,4-Dichlorophenol	alpha-Hexachlorocyclohexane (BHC)
Carbon Tetrachloride	2,4-Dinitrotoluene	Aldrin
Dibromochloromethane	2,4,6-Trichlorophenol	Chlordane
Hexachlorobenzene	2,6-Dinitrotoluene	Dieldrin
Hexachlorobutadiene	3,3-Dichlorobenzidine	Heptachlor
	3,4-Benzofluoranthene	Heptachlor Epoxide
	Benzidine	PCB-1016
INORGANICS and METALS	Benzo(a)pyrene	PCB-1221
Cadmium	Benzo(k)fluoranthene	PCB-1232
Chromium (VI)	Bis(2-chloroethyl)ether	PCB-1242
Silver	Bis(2-ethylhexyl)phthalate	PCB-1248
	Butyl benzyl phthalate	PCB-1254
Sulfide	Chrysene	PCB-1260
	Di-n-butylphthalate	Toxaphene
	Di-n-octylphthalate	Atrazine
	Dibenzo(a,h)-anthracene	Carbofuran
	Hexachlorocyclopentadiene	DBCP

	Indeno(1,2,3-c,d)pyrene N-Nitrosodimethylamine N-Nitrosodi-n-propylamine	Diquat Ethylene Dibromide, Simazine (Princep) 2,3,7,8-TCDD (Dioxin) Diazinon Chlorpyrifos

Effluent Limitations were established for constituents that were reported by the laboratory to be present at concentrations above the reporting limits and the water quality criteria, including Silver, DDE, Heptachlor Epoxide, PCBs, Atrazine, Dioxins and Furans, and Bis(2-ethylhexyl)phthalate.

CONSTITUENTS DETECTED JUST BELOW CRITERIA

VOLATILE ORGANICS
Dichloromethane

Effluent Monitoring data, submitted by the Discharger, contained concentrations of Dichloromethane, in three of seven samples, at 1.2, 2.4, and 3.1 µg/l. The CTR Criterion for Dichloromethane for the protection of Human Health (30-Day Average) for Drinking Water (consumption of water and aquatic organisms) is 4.7 µg/l. The detected concentrations do not exceed but are very close to the Criterion.

The attached Monitoring and Reporting Program requires the Discharger to continue monitoring for Priority Pollutants, including the constituents listed above, and other constituents, once a year in accordance with the SIP, Sections 2.3 and 2.4. This Order also contains a Provision that requires additional Priority Pollutant analysis when flows are greater than 3.5 mgd and the gravity filters are bypassed.

48. For MBAS, the U.S. EPA and the California DHS have developed an SMCL of 500 µg/l (0.50 mg/l). However, the existing Order No. 97-113 included Effluent Limitations for MBAS of 1.0 mg/l as a Monthly Average and 2.0 mg/l as a Daily Maximum; the source of these Effluent Limitations in not clear. A Reasonable Potential Analysis was conducted to determine whether MBAS has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards. The detected concentrations of MBAS must be compared to the SMCL of 500 µg/l.

Effluent monitoring results submitted by the Discharger (see Table 6), indicated the presence of MBAS, in eleven of twelve samples, at concentrations of 0.068, 0.075, 0.075, 0.10, 0.11, 0.11, 0.12, 0.13, 0.14, 0.21, and 0.22 mg/l.

While none of the concentrations exceeded the SMCL, Regional Board staff conducted a Reasonable Potential Analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). The Reasonable Potential Analysis indicated statistically, based on existing data, the highest expected concentration of MBAS is only slightly less than the

criterion. When rounded off, the statistically expected maximum concentration is equal to the criterion. The Reasonable Potential Analysis did not indicate a potential to exceed the SMCL criterion.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for MBAS is not considered backsliding if information is available which was not available at the time of permit issuance. New monitoring data indicated that there was no reasonable potential to exceed the SMCL.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(2), the adoption of less stringent effluent limitations for MBAS is not considered backsliding if technical mistakes were made in issuing the permit. The Effluent Limitations for MBAS in existing Order No. 97-113 do not appear to be based on water quality standards and no calculations were shown for establishing water quality based Effluent Limitations.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(ii), a permit to discharge to surface waters may not be renewed with a less stringent effluent limitation, if implementation of the limitation would result in violation of a water quality standard. The Reasonable Potential Analysis for MBAS indicated that the estimated maximum concentration did not exceed the SMCL. Therefore, this Order does not contain Effluent Limitations for MBAS.

Collection System

49. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs the raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.

Sanitary sewer overflows consist of varying mixtures of domestic sewage, industrial wastewater, and commercial wastewater. This mixture depends on the pattern of land use in the sewage collection system tributary to the overflow. The chief causes of sanitary sewer overflows include lack of maintenance, blockages due to grease, roots, and debris, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm water or groundwater inflow/infiltration, insufficient capacity, and contractor caused blockages.

Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause exceedance of applicable water quality objectives,

pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.

The Discharger is responsible for all necessary steps to adequately maintain and operate its sanitary sewer collection system.

Pretreatment

50. U.S. EPA Region IX staff conducted inspections, of significant industrial users (SIUs) and metal finishing operations within the Placer County Sewer Management District No. 1 sewer service area, in May 2003. As a result of those inspections, Carpenter Advanced Ceramics and Sierra Plating were issued Findings of Violation and Administrative Orders CWA-307-9-03-023 (Carpenter Advanced Ceramics) and CWA-307-9-03-024 (Sierra Plating), and Coherent Auburn Division was issued a Request for Information and Self-Monitoring Order CWA-308-9-04-001. Other industries that may discharge constituents of concern are located within the Discharger's service area. This Order includes a Provision requiring the Discharger to develop technically based local limits for industries and an Industrial Pretreatment Program.

The Federal Clean Water Act, Section 307(b), and Federal Regulations, 40 CFR Part 403, requires certain publicly owned treatment works to develop an acceptable industrial pretreatment program if the nature or volume of industrial influent causes; treatment plant upsets, violation of effluent limitations, contamination of sludge, or to prevent interference or pass through. 40 CFR 403.8(a) requires formal pretreatment programs for publicly owned treatment works with design flows of 5 mgd or greater. 40 CFR 403.8(a) also states that Publicly Owned Treatment Works (POTWs) with design flows of less than 5 mgd may be required to develop pretreatment programs if it is found that "*…the nature or volume of the industrial influent, treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge, or other circumstances warrant in order to prevent Interference with the POTW or Pass Through.*" The source of pollutants that have been limited by this Order may be from industrial discharges. A pretreatment program is required to prevent the introduction of pollutants that will interfere with treatment plant operations or sludge disposal and prevent pass through of pollutants that exceed water quality objectives, standards, or permit limitations. Federal Regulations (40 CFR 403.8) and this Order require the Discharger to develop and submit for approval by the Regional Board an acceptable industrial pretreatment program within one year of adoption of this Order.

The SMD-1 wastewater system serves several industries, including precision lens manufacturing, cooling towers, technical ceramics manufacturing, metal finishing and plating. Numerous pollutants of concern are discharged by industries in the service area, including aluminum, arsenic, copper, lead, mercury, nickel, oil and grease, organic solvents, phosphorous, plasticizers, salts, selenium, tributyltin, zinc, pH, and cooling tower biocides and corrosion inhibiting chemicals. The Discharger does not currently regulate wastewater discharges into the collection system from the industries. The industrial discharges have the potential to interfere with wastewater treatment process operations and pass through the system causing effluent limitation violations. The

Regional Board finds that industrial discharges into the SMD-1 wastewater system have the potential to cause interference or violation of effluent limitations and that development of an Industrial Pretreatment Program is necessary. This Order contains a Provision that requires development of an Industrial Pretreatment Program in accordance with Federal Regulations.

51. This Order prohibits bypass from any portion of the secondary treatment facility as required in *Standard Provisions and Reporting Requirements, For Waste Discharge Requirements, 1 March 1991, General Provisions, No. 13.* Federal Regulations, 40 CFR 122.41 (m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Board's prohibition of bypasses, the State Water Resources Control Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation. In the case of United States v. City of Toledo, Ohio (63 F. Supp 2d 834, N.D. Ohio 1999) the Federal Court ruled "any bypass which occurs because of inadequate plant capacity is unauthorized…to the extent that there are 'feasible alternatives', including the construction or installation of additional treatment capacity". This Order also requires that the tertiary treatment component of the system be operated to the maximum extent possible.

The Federal Clean Water Act, Section 301, requires that not later than 1 July 1977, publicly owned wastewater treatment works meet effluent limitations based on secondary treatment or any more stringent limitation necessary to meet water quality standards. Federal Regulations, 40 CFR, Part 133, establish the minimum level of effluent quality attainable by secondary treatment for BOD, TSS, and pH. Tertiary treatment requirements for BOD and TSS are based on the technical capability of the process. Biochemical oxygen demand (BOD) is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The solids, total suspended (TSS) and settleable (SS), content is also an important characteristic of wastewater. The secondary and tertiary treatment standards for BOD and TSS are indicators of the effectiveness of the treatment processes. Bypass of the filters was recommended by DHS when flow is greater than 3.5 mgd and 7-Day Median temperature of the receiving stream is less than 60 °F. This recommendation and the monitoring requirements, study requirements, and resulting limitations are discussed above.

The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Secondary treatment has been shown to be effective for pathogen removal. For additional pathogen reduction, tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream.

A wet weather influent waste stream may contain significantly diluted levels of BOD and TSS. A bypassed diluted waste stream may have BOD and TSS levels that meet the secondary or tertiary objectives, either alone or when blended with treated wastewater. However, the bypassed waste stream would not have been treated to reduce pathogens or other individual pollutants. The indicator parameters of BOD and TSS cannot be diluted to a level that may indicate the adequate treatment has occurred as an alternative to providing appropriate treatment.

52. The permitted discharge is consistent with the antidegradation provisions of the Code of Federal Regulations 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

53. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

54. The discharge is presently governed by Waste Discharge Requirements Order No. 97-113, adopted by the Regional Board on 20 June 1997.

55. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

56. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order.

57. The attached Monitoring and Reporting Program and Attachments A, B, C, D, E, F, G, H, and I are parts of this Order.

58. The attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, is a part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

59. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

60. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

61. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect 50 days following the date of the hearing, provided U.S. EPA has no objections.

IT IS HEREBY ORDERED that Order No. 97-113 is rescinded and Placer County Department of Facility Services, Placer County Sewer Maintenance District No. 1, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

4. The discharge or storage of waste classified as 'hazardous' or 'designated', as defined in Sections 2521(a) and 2522(a) of Title 27, is prohibited.

5. All wastewater shall be oxidized, coagulated and filtered, or equivalent treatment provided. Unfiltered wastewater may not be discharged unless both of the following conditions occur:

   a. The influent wet weather flow to the wastewater treatment plant exceeds 3.5 mgd and

   b. The 7-Day Median Receiving Water Temperature is less than 60 °F.

B. Effluent Limitations:

1. Effluent shall not exceed the following limits:

Constituents	Units	30-Day Average	4-Day Average [1]	1-Hour Average [2]	Daily Average	Instantaneous Maximum
Alachlor	µg/l	2	---	---	---	---
	lbs/day [3]	0.0364	---	---	---	---
Aluminum[7]	µg/l	58			160	---
	lbs/day [3]	1.1			2.9	---
Total Ammonia [4]	mg/l	Attach. E [1]	Attach. D	Attach. C	---	---
	lbs/day [3]	Calculate [5]	Calculate [5]	Calculate [5]	---	---
Atrazine	µg/l	---	---	---	---	1.0
	lbs/day [3]	---	---	---	---	0.0182
Chlorine Residual	mg/l	---	0.01	0.02	---	---
	lbs/day [3]	---	0.182	0.364	---	---
Chloroform	µg/l	1.1	---	---	---	---
	lbs/day [3]	0.020	---	---	---	---
Manganese	µg/l	50	---	---	---	---
	lbs/day [3]	0.910	---	---	---	---
Mercury	lbs/day	0.00021 [6]	---	---	---	---
MTBE	µg/l	5	---	---	---	---
	lbs/day [3]	0.0910	---	---	---	---
Total Nitrate plus Nitrite (as N)	mg/l	10	---	---	---	---
	lbs/day [3]	182	---	---	---	---
Nitrite	mg/l	1	---	---	---	---
	lbs/day [3]	18.2	---	---	---	---
Oil and Grease	mg/l	10	---	---		15
	lbs/day [3]	182	---	---		273
PAEs	µg/l	3.0	---	---	---	---
	lbs/day [3]	0.055	---	---	---	---
Chlorinated Hydrocarbon Pesticides	µg/l	0.00	---	---		0.0
	lbs/day [3]	0.0000	---	---		0.0
Settleable Solids	ml/l	0.1	---	---		0.2
Tributyltin	µg/l	0.04			0.12	---
	lbs/day [3]	0.00073			0.0020	---

[1] Continuous Concentration (Chronic)
[2] Maximum Concentration (Acute)
[3] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (*x* mg/l x 8.345 x 2.18 mgd = *y* lbs/day).
[4] Temperature and pH must be determined concurrently.
[5] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (*x* mg/l x 8.345 x 2.18 mgd = *y* lbs/day), where *x* is the value obtained from Attachment C, D, or E, as specified above.
[6] Calculated from the Maximum Average Flow Rate of 2.56 mgd and maximum reported Mercury concentration of 0.00987 µg/l (0.00000987 mg/l x 8.345 x 2.56 mgd) = 0.00021 lbs/day).

[7] Aluminum samples may be analyzed using the acid soluble method described in U.S. EPA's Ambient Water Criteria document for aluminum 1988[EPA 440/5-86-008], with the modification that an inductively coupled plasma (ICP)/mass spectrometry analysis be substituted for the ICP/atomic emission spectrometric analysis.

2. When flow is less than or equal to 3.5 mgd:

Constituent	Units	Monthly Average	Weekly Average	7-Day Median	24-Hour Average	Daily Maximum
BOD [1]	mg/l	10 [2]	15 [2]	---	---	25 [2]
	lbs/day [3]	182	273	---	---	455
Total Suspended Solids	mg/l	10 [2]	15 [2]	---	---	25 [2]
	lbs/day [3]	182	273	---	---	455
Total Coliform Organisms	MPN/100 ml	---	---	2.2 [4]	---	23/240 [5]
Turbidity	NTU	---	---	---	2	5 to 10 [6]

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a flow proportional 24-hour composite
[3] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (x mg/l x 8.345 x 2.18 mgd = y lbs/day)
[4] 7-Day Median based on previous seven daily sample results
[5] In a 30-day period, only a single sample may exceed 23 MPN/100 ml, and no sample shall exceed 240 MPN/100 ml
[6] May not exceed 5 NTU more than 5% of the time in any 24-hour period and at no time exceed 10 NTU

3. When wet weather flow is greater than 3.5 mgd and the 7-Day Median Receiving Water Temperature is less than 60 °F:

Constituent	Units	Monthly Average	Monthly Median	Weekly Average	Daily Maximum
BOD [1]	mg/l	20 [2]	---	30 [2]	50 [2]
	lbs/day [3]	364	---	546	910
Total Suspended Solids	mg/l	20 [2]	---	30 [2]	50 [2]
	lbs/day [3]	364	---	546	910
Total Coliform Organisms	MPN/100 ml	---	2.2 [4]	---	23/240 [5]

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a flow proportional 24-hour composite
[3] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (x mg/l x 8.345 x 2.18 mgd = y lbs/day)
[4] 30-day Median based on previous thirty daily sample results
[5] In a 30-day period, only a single sample may exceed 23 MPN/100 ml and no sample shall exceed 240 MPN/100 ml

4. Provision No. 10, below, contains instructions for submittal and justification of a schedule for compliance with the CTR and interim Effluent Limitations, in lieu of immediate compliance with final Effluent Limitations. See Provision No. 10 to determine the appropriate schedule below.

If a compliance schedule is not justified, full compliance with the CTR is immediate, and **from 1 June 2005 and thereafter**, effluent shall not exceed the following limits:	or	If a compliance schedule is justified, the interim Effluent Limitations in Effluent Limitation No. 5, below, are applicable **prior to 30 March 2010, and from 30 March 2010 and thereafter**, in full compliance with the CTR, effluent shall not exceed the following limits:

Final Effluent Limitations for CTR Constituents:

Constituents	Units	30-Day Average	Daily Maximum
Bis-(2-ethylhexyl)phthalate	µg/l	1.8	---
	lbs/day [1]	0.0327	---
Bromodichloromethane	µg/l	0.56	---
	lbs/day [1]	0.0102	---
Copper [2]	µg/l	Attachment F [3]	Attachment F [4]
	lbs/day [1]	Calculate [5]	Calculate [5]
Dioxin and Furans [6]	µg/l	1.3×10^{-8}	---
	lbs/day [1]	2.36×10^{-10}	---
Lead [2]	µg/l	Attachment G [3]	Attachment G [4]
	lbs/day [1]	Calculate [5]	Calculate [5]
PCBs [7]	µg/l	1.7×10^{-4}	---
	lbs/day [1]	3.09×10^{-6}	---
Silver [2]	µg/l	Attachment H [3]	Attachment H [4]
	lbs/day [1]	Calculate [5]	Calculate [5]
Zinc [2]	µg/l	Attachment I [3]	Attachment I [4]
	lbs/day [1]	Calculate [5]	Calculate [5]

[1] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (x mg/l x 8.345 x 2.18 mgd = y lbs/day)
[2] Hardness must be determined concurrently
[3] Average Monthly Effluent Limitation (AMEL)
[4] Maximum Daily Effluent Limitations (MDEL)
[5] Based upon the Design Dry Weather Flow Rate of 2.18 mgd (x mg/l x 8.345 x 2.18 mgd = y lbs/day), where x is the value obtained from Attachments F, G, H or I, as specified above.
[6] Sum of all Dioxins and Furans
[7] Sum of all Aroclors

5. If a schedule for compliance with the CTR is granted pursuant to Provision No. 10, below, full compliance with the CTR and Effluent Limitation No. 4, above, are required **from 30 March 2010 and thereafter, and prior to 30 March 2010** effluent shall not exceed the following interim limits:

Constituents	Units	Daily Maximum
Bis-(2-ethylhexyl)phthalate	µg/l	9.11
Bromodichloromethane	µg/l	5.48
Copper	µg/l	6.33
Dioxin and Furans [1]	µg/l	10.36×10^{-6}
Lead	µg/l	4.25
PCBs [2]	µg/l	17.73
PCB Aroclor 1016	µg/l	0.81
PCB Aroclor 1221	µg/l	17.73
PCB Aroclor 1260	µg/l	0.24
Silver	µg/l	3.14
Zinc	µg/l	60.72

[1] Sum of all Dioxins and Furans
[2] Sum of all Aroclors

6. Wastewater shall be oxidized, coagulated and filtered, or equivalent treatment provided when flows are less than or equal 3.5 mgd. When flows are greater than 3.5 mgd, the coagulation and filtration systems shall be operated to the maximum extent possible and all wastewater shall receive full secondary treatment.

7. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

8. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

9. The average daily dry weather discharge flow shall not exceed 2.18 million gallons.

10. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay---------- 70%
Median for any three or more consecutive bioassays ---------- 90%

C. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation.

2. The ambient pH to fall below 6.5 or exceed 8.5, or the 30-day average ambient pH to change by more than 0.5 units.

3. The ambient temperature to increase more than 5°F.

4. The turbidity to increase as follows:

   a. The 30-day average turbidity to increase more than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

   b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

   c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

   d. More than 10 percent where natural turbidity is greater than 100 NTUs.

5. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

6. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

7. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

8. Esthetically undesirable discoloration.

9. Fungi, slimes, or other objectionable growths.

10. Deposition of material that causes nuisance or adversely affects beneficial uses.

11. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

12. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

13. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

14. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.

15. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

D. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and U.S. EPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

   If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

4. The Discharger is encouraged to comply with the "*Manual of Good Practice for Agricultural Land Application of Biosolids*" developed by the California Water Environment Association.

E. Groundwater Limitations:

1. The release of waste constituents from any transport, storage, treatment, or disposal component associated with the WWTP or collection system shall not cause the underlying groundwater to be degraded.

F. Provisions:

1. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

2. The Discharger shall use the best practicable treatment or control technique currently available to limit mineralization to no more than a reasonable increment.

3. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

4. **Provision for TIE/TRE:** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a work plan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if the State Water Resources Control Board adopts a chronic toxicity water quality objective, this Order may be reopened and a limitation based on that objective included.

5. **Provision for Optimum Operation of the Filters:** This Order requires that the tertiary filters be operated with optimum efficiency. When wet weather flow to the treatment plant exceeds 3.5 mgd, flow through the filters shall be maximized (approximately 3.5 mgd) to optimize tertiary treatment.

6. **Compliance Schedule for Electronic Notification Systems:** This Order and the Monitoring and Reporting Program, which is a part of this Order, require that certain parameters be monitored on a continuous basis. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For existing continuous monitoring systems, the electronic notification system shall be installed by **30 June 2005**. For continuous monitoring systems installed following permit adoption, the electronic notification system shall be installed simultaneously.

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

7. **Compliance Schedule for an Industrial Pretreatment Program:**
By 30 September 2005, the Discharger shall submit for Regional Board approval, an Industrial Pretreatment Program, including technically based local limits, as more completely set forth in 40 CFR 403, the legal authorities, programs, and controls necessary to ensure that industrial discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction discharges from other sources. The Discharger shall not allow industrial discharges into the system that:

   a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

   b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

   The Discharger shall enforce the Pretreatment Standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including but not limited to:

   a. Adopting the legal authority required by 40 CFR 403.8(f)(1);

   b. Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

   c. Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

   d. Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

   The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB) or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the Clean Water Act. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary

legal authorities, programs, and controls to ensure that incompatible wastes are not introduced to the treatment system.

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

8. **Sanitary Sewer System Operation, Maintenance and Overflow Prevention:** The Discharger shall maintain all portions of the wastewater collection system to assure compliance with this Order. Collection system overflows and/or discharges are prohibited by this Order. All violations of this Order, collection system overflows, must be reported as specified in Standard Provisions and the public shall be notified in areas that have been contaminated with sewage. All parties with a reasonable potential for exposure to a sewage overflow event shall be notified.

9. **Provision for Flow Rates greater than 3.5 mgd and Bypass of the Gravity Filters:**

   a. **Compliance Schedule for Flow Monitoring Systems:** This Order and the Monitoring and Reporting Program, which is a part of this Order, require that flow be monitored accurately year-round, including during high flows. The existing flow monitors for plant effluent are inadequate during high flows. In addition, the flow-based limitations for Total Coliform Organisms, BOD and TDS, and Turbidity, require accurate monitoring of the flows entering and exiting the gravity filters, and entering and exiting the chlorine contact basins. The Discharger is required to upgrade the plant effluent flow monitoring system and install adequate flow monitoring. The Discharger is required to upgrade flow monitors for the influent and effluent to the gravity filters and chlorine contact basins, if necessary.

Task	Compliance Date
Complete Installation of all required flow monitoring systems	**30 August 2005**
Submit Confirmation that work was completed, (separate report)	**30 September 2005**

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

b. **Compliance Schedule for Optimizing Existing Disinfection and Filtration Processes During Wet Weather:** To assure optimal operation of existing facilities to meet the more stringent disinfection requirements required by this Order, the Discharger shall evaluate modal contact time within the Chlorine Contact Basins, and shall make any necessary changes to facilities and operations to make maximal use of the disinfection and filtration systems year-round. Numerous engineering options are available to increase the existing disinfection system capabilities, such as increasing the modal contact time (short of constructing new tanks) or increasing the chlorine dose rate. This Order allows partial bypass of the filtration system during specific peak-wet weather conditions. During these wet weather periods it is critical that the disinfection and filtration processes are maximized. The Discharger must complete the following:

Task	Compliance Date
Submit Chlorine Contact Basin Modal Contact Time Report	**30 September 2005**
The Discharger shall modify the existing facilities as necessary to utilize the disinfection and filtration processes to the maximum extent practicable.	**30 October 2005**

The initial Modal Contact Time shall be calculated as the time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to the chlorine contact chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber. The Chlorine Contact Time compliance determination shall be calculated in accordance with recommendations from the California Department of Health Services (DHS) and approved by Regional Board staff (or by utilizing the DHS, 13 December 2001, memorandum *CT Compliance Determination*). The required investigations and reports must be prepared, stamped and signed by a California Registered Civil Engineer with experience in the design and operation of wastewater treatment plants.

The Discharger shall submit to the Regional Board on or before each compliance date, a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

c. **Compliance Schedule for I/I Reduction Program:** The Dischargers wastewater collection system is subject to high flows due to infiltration and inflow (I/I) into the collection system that have resulted in the Discharger requesting relaxed discharge standards during periods of high flow and cold temperatures. I/I is typically due to faulty construction or inadequate maintenance. The elimination of I/I flow rates will

result in the elimination of filtration bypasses and aid in the ability to produce a higher quality of wastewater effluent that is protective of the beneficial uses of the receiving stream. The Discharger is required to fully assess the sources of I/I into the entire collection system, develop a priority list of collection system repairs and schedule and complete the repairs to reduce I/I flows to the maximum extent practicable. The Discharger is required to complete an I/I reduction program according to the following schedule:

Task	Compliance Date
Submit Workplan for I/I source identification -	**30 November 2005**
Complete I/I source study -	**30 November 2006**
Submit priority list for I/I reduction list and schedule for implementation -	**1 February 2007**
Complete I/I reduction program and submit final report assessing the effectiveness of the program -	**30 December 2009**
Complete Collection System Improvements	**30 December 2009**

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

10. **Compliance Schedule for Implementation of Effluent Limitations for NTR and CTR Constituents; Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc:** The preliminary NTR and CTR data submitted by the Discharger to date, indicate that the discharge contains constituents that have a reasonable potential to cause or contribute to an exceedance of water quality standards. Therefore, water quality based Effluent Limitations have been included in this Order for the constituents Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc. Within **60 days of adoption of this Order,** the Discharger shall complete and submit justification for a compliance schedule for Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc. The justification for the compliance schedule shall include all items specified by the SIP, Section 2.1, Paragraph 3 (items (a) through (d)).

    If no justification for a compliance schedule is submitted, or the submittal **does not meet** the requirements of Section 2.1 of the SIP, then implementation of the new Effluent Limitations becomes effective on **1 June 2005**.

If the justification for a compliance schedule submitted by the Discharger **does meet** the requirements of the SIP, then the new final water quality based Effluent Limitations required by this Order for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc, shall become effective on **1 March 2010**. The Discharger shall submit semiannual progress reports on **15 January and 15 July each year** unit the Discharger achieves compliance with the final water quality based Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc. Prior to **1 March 2010**, the Discharger shall comply with the interim Effluent Limitations for CTR constituents, above.

The Discharger shall complete a study to assess the sources of Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc and determine if source control measures or treatment are necessary to achieve compliance. The Discharger must comply with the following schedule to evaluate Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc concentrations in effluent from SMD1, and in the receiving water, and to develop a source control program or treatment measures necessary to achieve compliance with this Order:

Task	Compliance Date
Submit Plan for Study	**1 December 2005**
Begin Study	**1March 2006**
Complete Study	**1 March 2007**
Submit Report on Study	**1 June 2007**
Begin Implementation	**1 June 2008**
Full Compliance with Effluent Limitations	**1 March 2010**

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

If new water quality criteria or objectives for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc are adopted, this Order will be reopened and the Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc will be modified or new ones added, as necessary.

11. **Compliance Schedule to Determine Impacts of EC and TDS:** There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality standards for EC and TDS. The Discharger shall comply

with the following time schedule in conducting a study of the potential effects of these constituents in surface waters:

Task	Compliance Date
Begin Study	**1 August 2005**
Submit Study Report	**30 November 2006**

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of any water quality standard this Order will be reopened and effluent limitations added for the subject constituents.

12. **Compliance Schedule to Determine Presence of Petroleum Hydrocarbon Compounds:** There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality standards for TPHg, TPHd, and TPHk. The Discharger shall comply with the following time schedule in conducting a study of the potential effects of these constituents in effluent:

Task	Compliance Date
Begin Study	**30 September 2005**
Submit Study Report	**30 September 2006**

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of any water quality standard this Order will be reopened and effluent limitations added for the subject constituents.

13. To provide the information necessary to evaluate the need for additional tertiary treatment, or equivalent, in the event that SMD-1 will continue to discharge, this Order requires the Discharger to conduct the following analyses. The Discharger shall conduct an analysis to determine if bypassing filtration during wet weather periods provides BPTC in accordance

with State Board Resolution No. 68-16, the antidegradation policy. The BPTC analysis shall be completed, stamped and signed, by a California registered Civil Engineer with experience in design and operations of wastewater treatment and collection systems. The BPTC analysis will be due prior to making a decision of whether regionalization is feasible and will require analysis of at least the following:

- Whether 20-to-1 dilution (receiving stream flows to effluent flow) exists during wet weather periods,
- Identification and prioritization of wet weather flows in a comprehensive I/I reduction program to assess the amount of flow reduction that can be expected to be achieved,
- A flow equalization analysis to contain the "excess" wet weather flows,
- An analysis of tertiary treatment design parameters for dry and wet weather flow rates to determine the actual current dry and wet weather design of the filtration system,
- A treatability analysis to determine what treatment train will be necessary to comply with CTR limitations,
- An analysis of the SMD-1 system, what parameters make it, the service area and the downstream beneficial uses unique to receive relaxed wet weather effluent limitations in providing BPTC,
- A complete and through cost analysis of maximizing I/I reductions, providing additional treatment to comply with CTR based limitations, adding equalization basins, building additional filters, tying into the regional wastewater plant and any other alternatives evaluated. The cost analysis must contain a detailed basis for the total costs and an assessment of monthly per household/increases for each alternative.

Task	Compliance Date
Submit workplan and schedule for BPTC analysis	**30 June 2005**
Submit final BPTC report	**30 June 2006**
Provide BPTC	**30 Jan. 2009**

If wastewater regionalization is not the selected alternative and based on the findings of the BPTC analysis, this Order may be reopened and additional equivalent to tertiary discharge limitations may be added to protect the beneficial uses of the receiving waters.

The Discharger shall submit to the Regional Board on or before each compliance date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the compliance schedule.

14. The Discharger shall submit a sludge disposal plan describing the annual volume of sludge generated by the plant and specifying the disposal practices.

Task	Compliance Date
Submit Sludge Disposal Plan	**30 September 2005**

15. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

16. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

17. The Discharger shall comply with Monitoring and Reporting Program No. R5-2005-0074, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

    When requested by U.S. EPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

18. This Order expires on 1 June 2010 and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

19. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (Regional Board or RWQCB), the State Water Resources Control Board (SWRCB) or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the Clean Water Act.

20. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

    a. Wastes that create a fire or explosion hazard in the treatment works;

    b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Board approves alternate temperature limits;

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.

21. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

    a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

    b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

22. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).

23. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 June 2005.

_____

THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0074
NPDES NO. CA0079316
FOR

PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
PLACER COUNTY SEWER MAINTENANCE DISTRICT NO. 1
WASTEWATER TREATMENT PLANT
PLACER COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Section 13383. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring results shall be submitted annually. Water supply monitoring shall include at least the following:

CONSTITUENTS	UNITS	SAMPLING FREQUENCY
Total Dissolved Solids (TDS)	mg/l	Yearly
Electrical Conductivity (EC) at 25°C [1]	μmhos/cm	Yearly

[1] If the source water is from more than one source, the EC shall be reported as a weighted average and include copies of supporting calculations.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent. Influent monitoring shall include at least the following:

CONSTITUENT	UNITS	SAMPLE TYPE	SAMPLING FREQUENCY
Flow	mgd	Meter	Continuous
BOD [1]	mg/l, lbs/day	24 hr. Composite [2]	5 Days/Week
Total Suspended Solids (TSS)	mg/l, lbs/day	24 hr. Composite [2]	5 Days/Week

[1] 5-day, 20º C biochemical oxygen demand (BOD)
[2] 24-hour composite samples shall be flow proportional

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

TABLE 1

CONSTITUENTS	UNITS	TYPE OF SAMPLE	SAMPLING FREQUENCY
Flow	MGD	Meter	Continuous [1]
Turbidity [2]	NTU	Meter	Continuous [1]
Chlorine Residual	mg/l	Meter	Continuous [1]
Temperature	°F	Grab [3]	Daily
Settleable Solids	ml/l	Grab [3]	Daily
Electrical Conductivity @ 25°C	µmhos/cm	Grab [3]	Daily
pH	--	Grab [3]	Daily
Total Coliform Organisms	MPN/l00 ml	Grab [3]	Daily
Total Ammonia [4, 5]	mg/l, lbs/day	Grab [3]	Daily
Total Nitrate plus Nitrate (as N)	mg/l, lbs/day	Grab [3]	Daily
Nitrite	mg/l, lbs/day	Grab [3]	Daily
BOD [6]	mg/l, lbs/day	24-Hr Composite [7]	5 Days/Week
Total Suspended Solids	mg/l, lbs/day	24-Hr Composite [7]	5 Days/Week
Total Dissolved Solids	mg/l, lbs/day	Grab	Monthly
Oil and Grease	mg/l, lbs/day	Grab	Quarterly
Acute Toxicity [8, 9]	% Survival	Grab	Quarterly

1 For continuous monitoring, the daily maximum, minimum, and average shall be reported.
2 Collected from outfall of gravity filters.
3 Daily Grab samples shall **not** be collected at the same time each day.
4 Concurrent with Acute Toxicity monitoring, Temperature, and pH.
5 Report as Total Ammonia.
6 5-Day, 20°C Biochemical Oxygen Demand (BOD)
7 24-Hour Composite samples shall be flow-proportional.
8 In October 2002, U.S. EPA promulgated new toxicity test methods. The acute toxicity bioassay samples shall be analyzed using *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA/821-R-02-012, or later amendment with Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*), with no pH adjustment.
9 Concurrent with Ammonia sampling.

TABLE 2

CONSTITUENTS	UNITS	TYPE OF SAMPLE	SAMPLING FREQUENCY
Aluminum [10, 11]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Copper [10, 11, 12]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Iron [10]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Lead [10, 11, 12]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Manganese [10]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Mercury [13]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Silver [10, 11, 12]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Tributyltin	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Zinc [10, 11, 12]	µg/l, lbs/day	24-Hr Composite [7]	Quarterly
Bis(2-ethylhexyl)phthalate	µg/l, lbs/day	Grab	Quarterly
Bromodichloromethane	µg/l, lbs/day	Grab	Quarterly
Chlorinated Hydrocarbon Pesticides	µg/l, lbs/day	Grab	Quarterly
Chloroform	µg/l, lbs/day	Grab	Quarterly
MTBE	µg/l, lbs/day	Grab	Quarterly
Alachlor	µg/l, lbs/day	Grab	Quarterly
Atrazine	µg/l, lbs/day	Grab	Quarterly
Dioxins and Furans	µg/l, lbs/day	Grab	Quarterly
PAEs	µg/l, lbs/day	Grab	Quarterly
PCBs (all Aroclors)	µg/l, lbs/day	Grab	Quarterly
PCB Aroclor 1016 [11]	µg/l, lbs/day	Grab	Quarterly
PCB Aroclor 1221 [11]	µg/l, lbs/day	Grab	Quarterly
PCB Aroclor 1260 [11]	µg/l, lbs/day	Grab	Quarterly
Priority Pollutants [10, 11, 14, 15, 16, 18]	mg/l	As Appropriate [7, 17]	Annually

[7] 24-Hour Composite samples shall be flow-proportional.

[10] Total Recoverable Metals

[11] If any single sample exceeds the 4-Day Average Effluent Limitation, the Discharger shall conduct additional sampling for 4 consecutive days for those constituents that exceeded the 4-Day Average.

[12] Concurrent with Hardness

[13] Clean Laboratory Techniques

[14] Concurrent with Hardness, Temperature, and pH

[15] All peaks are to be reported, along with any explanation provided by the laboratory.

[16] Priority Pollutants is defined as U.S. EPA Priority Pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule and identified in the 13267 letter dated 9/10/01.

[17] Volatile samples shall be grab samples, the remainder shall be 24-Hour Composite samples.

[18] Includes constituents listed in Finding No. 43 of Order No._____, as follows: Cadmium, Chromium (VI), Silver, Phosphorus, Sulfide, 1,1-Dichloroethene, 1,1,2,2-Tetrachloroethane, 1,2-Dichloroethane, Acrylonitrile, Carbon Tetrachloride, Dibromochloromethane, Hexachlorobenzene, Hexachlorobutadiene, 1,2-Benzanthracene, 1,2-Diphenylhydrazine, 2-Chlorophenol, 2,4-Dichlorophenol, 2,4-Dinitrotoluene, 2,4,6-Trichlorophenol, 2,6-Dinitrotoluene, 3,3-Dichlorobenzidine, 3,4-Benzofluoranthene, Benzidine, Benzo(a)pyrene, Benzo(k)fluoranthene, Bis(2-chloroethyl)ether, Bis(2-ethylhexyl)phthalate, Butyl benzyl phthalate, Chrysene, Di-n-butylphthalate, Di-n-octylphthalate, Dibenzo(a,h)-anthracene, Hexachlorocyclopentadiene, Indeno(1,2,3-c,d)pyrene, N-Nitrosodimethylamine, N-Nitrosodi-n-propylamine, 4,4-DDD, 4,4-DDE, 4,4-DDT, alpha-Hexachlorocyclohexane (BHC), Aldrin, Chlordane, Dieldrin, Heptachlor, Heptachlor Epoxide, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, Toxaphene, Atrazine, Carbofuran, DBCP, Diquat, Ethylene Dibromide, Simazine (Princep), 2,3,7,8-TCDD (Dioxin), Diazinon, Chlorpyrifos.

TABLE 3 – Additional Effluent Monitoring when bypassing filters, flow > 3.5 MGD, and 7-Day Median Receiving Water Temperature < 60 °F

CONSTITUENTS	UNITS	TYPE OF SAMPLE	SAMPLING FREQUENCY
Filter Effluent Flow	MGD	Meter	Continuous [1]
Chlorine Contact Basin Influent Flow	MGD	Meter	Continuous [1]
Turbidity from Effluent Outfall	NTU	Meter	Continuous [1]

[1] For continuous monitoring, the daily maximum, minimum, and average shall be reported.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples.

1. Receiving water monitoring shall include at least the following:

Station	Description
R-l	Rock Creek, 50 feet upstream from the point of discharge
R-2	Rock Creek, just prior to the confluence of Rock Creek and Dry Creek
R-3	Dry Creek, just prior to the confluence of Rock Creek and Dry Creek
R-4	Dry Creek, 150 feet downstream of the confluence of Rock Creek and Dry Creek

CONSTITUENTS	UNITS	STATION	SAMPLING FREQUENCY
Dissolved Oxygen	mg/l	R-l, R-2, R-3, R-4	Daily
PH	--	R-l, R-2, R-3, R-4	Daily
Turbidity	NTU	R-l, R-2, R-3, R-4	Daily
Temperature [1]	°C	R-l, R-2, R-3, R-4	Daily
Electrical Conductivity @25°C	µmhos/cm	R-1, R-2, R-3, R-4	Daily
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2, R-3, R-4	Monthly
Radionuclides	pCi/l	R-1, R-2, R-3, R-4	Annually

1 Between 1 October and 1 May, Discharger shall calculate and report the 7-Day Median Temperature for R-1 and R-3. The 7-Day Median is based on previous seven daily sample results.

2. Additional Receiving Water Monitoring when bypassing filters, flow > 3.5 MGD, and 7-Day Median Receiving Water Temperature < 60 °F:

CONSTITUENTS	UNITS	STATION	SAMPLING FREQUENCY
Total Coliform Organisms	MPN/100 ml	R-1, R-2, R-3, R-4	Daily
Escherichia coli	MPN/100 ml	R-1, R-2, R-3, R-4	Daily

3. In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-l and R-2, and R-3, and R-4. Attention shall be given to the presence or absence of:

   a. Floating or suspended matter
   b. Discoloration
   c. Bottom deposits
   d. Aquatic life
   e. Visible films, sheens or coatings
   f. Fungi, slimes, or objectionable growths
   g. Potential nuisance conditions

   Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to Rock Creek and Dry Creek. Chronic Toxicity Monitoring shall be conducted on Rock Creek and Dry Creek concurrently. In October 2002, U.S. EPA promulgated new Toxicity Test Methods. The Chronic Toxicity testing shall be conducted as specified in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms,* Fourth Edition, EPA/21-R-02-013, or later amendment with Board staff approval. Chronic toxicity samples shall be collected at the discharge of the WWTP prior to its entering Rock Creek. Twenty-four-hour composite samples shall be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. The effluent tests must be conducted with concurrent reference toxicant tests. Monthly laboratory reference toxicant tests may be substituted upon approval. The control water, or standard dilution water, shall be provided by the laboratory or collected from the potable water supply at the facility. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test as soon as possible after being notified by the laboratory, but not later than 14 days.

Chronic toxicity monitoring results are to be submitted quarterly. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas* (larval stage), *Ceriodaphnia dubia*, and *Selenastrum capricornutum*
Frequency: Once per quarter, four quarters per year
Dilution Series: None

SLUDGE MONITORING

A composite sample of sludge shall be collected annually, and tested for the following metals:

Arsenic	Cyanide	Nickel
Cadmium	Lead	Silver
Chromium	Mercury	Zinc
Copper	Molybdenum	

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.

By 30 January 2003, and annually thereafter, the Discharger shall submit:

a. Annual sludge production in dry tons and percent solids.

b. A schematic diagram showing sludge handling facilities and a solids flow diagram.

c. Depth of application and drying time for sludge drying beds.

d. A description of disposal methods. If more than one method is used, include the percentage of annual sludge production disposed by each method.

REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day of the second month following sample collection**. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the time and date of sample collection, the constituents, and the concentrations are readily discernible. The data shall be summarized to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages and medians, and removal efficiencies (%) for BOD and Suspended Solids, should be determined and recorded. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).

b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

23 June 2005
(Date)

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2005-0074
NPDES NO. CA0079316
PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
PLACER COUNTY SEWER MAINTENANCE DISTRICT NO. 1
WASTEWATER TREATMENT PLANT
PLACER COUNTY

This permit, NPDES No. CA0079316, regulates the treatment of up to 2.18 million gallons per day of wastewater (design dry weather flow) from Placer County Department of Facility Services, Sewer Maintenance District No. 1 Wastewater Treatment Plant (SMD1 or WWTP), and the discharge of the treated wastewater to Rock Creek and downstream waters. The existing Waste Discharge Requirements Order No. 97-113 was adopted on 20 June 1997 and expired 1 June 2002. The existing Order was a renewal of previous Order No. 92-116. Placer County Department of Facility Services (hereafter Discharger) owns and operates a wastewater collection, treatment, and disposal system for the unincorporated area of North Auburn that serves a population of approximately 15,000 and includes much of the industrial area of Auburn. The terrain in North Auburn, including the WWTP and its service area, is mountainous. The WWTP location is shown in Attachment A, and a process flow schematic is shown in Attachment B. The WWTP is on Joeger Road, approximately ½ mile west of Highway 49 in North Auburn. The discharge is to Rock Creek and the outfall location is described as latitude 38° 57' 55" longitude 121° 06' 15".

The WWTP currently provides tertiary treatment when influent flows are 3.5 MGD or less. When flows are greater than 3.5 MGD the discharge from the WWTP is some combination of secondary and tertiary treated wastewater as described below. The plant consists of the following: Headworks: influent flow meter, comminution, and aerated grit removal; Primary Clarification: two rectangular primary clarifiers; Secondary Treatment: three Rotating Biological Contactors (RBCs), two trickling filters, and four circular clarifiers; Biological treatment for ammonia removal is provided by the RBCs and trickling filters; Intermediate and final clarification is provided by the four circular clarifiers. Gravity Filtration: six gravity filters with anthracite media; Coagulants are used prior to filtration. The capacity of the filters is 3.5 MGD (peak wet weather flow is over 8 MGD). Disinfection: three chlorine contact chambers and dechlorination is provided by sulfur dioxide gas. Sludge Treatment: primary and secondary digesters, belt press, and sludge drying beds.

Prior to recently completed plant improvements, the WWTP had several operational difficulties, including the following:

A. During high flows, it was possible for the primary clarifier to be flooded, causing scum and grease to pass through.

B. In the past it has been difficult for the operators to maintain nitrification in the RBCs, particularly in cooler temperatures and ammonia was frequently detected in the receiving water. In order to meet receiving water limits for ammonia in the existing Permit, the Discharger purchased water from the Placer County Water Agency to dilute ammonia levels before discharge to Rock Creek.

C. If all flow is allowed to pass through the gravity filters during high flows, the gravity filters may be overloaded and cause backflow into the secondary clarifiers. Therefore, it is sometimes necessary to rout high flows around the gravity filters to the chlorine basins, to avoid overloading the filters and backflow into the secondary clarifiers. There have been occasions when the gravity filters were bypassed completely.

The Discharger proposed plant improvements to the Regional Board in a report that was received 26 May 2000. In a 5 September 2000 letter to the Discharger, Regional Board staff commented that reductions in ammonia concentrations could result from the proposed improvements that would comply with the receiving water limitations in the existing permit. However, Regional Board staff noted that when the permit is renewed, the Receiving Water Limitations for ammonia must be changed to Effluent Limitations, and recommended that the Discharger consider this factor in their calculations and construction plans. In addition, Regional Board staff noted that the proposals did not appear to include denitrification and recommended that the Discharger consider future effluent limitations for nitrates.

The Discharger recently completed WWTP upgrades to resolve the operational difficulties described above, including the following:

A. An additional combination primary clarifier/flow equalization basin was constructed. During high flows, the new primary clarifier/flow equalization basin will be used as a primary clarifier to eliminate flooding of the existing primary clarifier. When flows are low, filter backwash and pressate from the sludge filter press may be routed to the equalization basin to equalize the ammonia loading to the nitrification unit processes.

B. Two existing but unused trickling filters were retrofitted to provide additional nitrification. (The RBCs provide removal of organic matter and partial ammonia removal.)

C. From the primary clarifiers, flow was rerouted to the RBCs as a step-feed system, replacing the previous plug-flow system.

D. Former final clarifiers 1 and 2 will be used as intermediate clarifiers, and clarifiers 3 and 4 will be used as final clarifiers during dry weather. Clarifiers 3 and 4 were modified to increase wall height to allow gravity flow to the trickling filters. When sustained influent flows exceed 3.5 MGD, excess flow will be routed around the trickling filters and flow directly to the final clarifiers. A secondary benefit of the retrofit of final clarifiers 3 and 4 is that the gravity filters can now be used during high flows up to 3.5 MGD. All flows greater than 3.5 MGD must also be routed around the gravity filters to the chlorine contact chambers.

The point of effluent discharge to Rock Creek is described as latitude 38° 57’ 55” longitude 121° 06’ 15”. The discharge point on Rock Creek, is approximately 200 feet upstream of the confluence

with Dry Creek. Approximately 1.7 miles downstream of the confluence with Rock Creek, Dry Creek merges with Orr Creek. Downstream of the point where Dry and Orr Creeks merge, the creek is called Coon Creek. On Coon Creek, approximately 0.9 miles downstream of the Dry/Orr Creek confluence, there is a diversion dam operated by Nevada Irrigation District (NID) for irrigation purposes. From this point, the flow of water, including effluent, has been traced downstream as follows:

A. In western Placer and eastern Sutter Counties, downstream of the NID Diversion Dam, Coon Creek flows approximately 25 miles through a relatively flat area where the flow meanders and splits into several channels, including Main Canal, Bunkham Slough, Markham Ravine, and East Side Canal. Flow from these channels eventually enters Natomas Cross Canal. Flow from Natomas Cross Canal enters the Sacramento River just below the confluence with the Feather River. The total distance from the discharge point on Rock Creek to the Sacramento River is approximately 34.5 miles.

B. The NID Diversion Dam pulls water from Coon Creek into Camp Far West Ditch or Canal. Water from Camp Far West Ditch follows several flow paths to the Bear River, which is tributary to the Feather River and the Sacramento River, as follows:

    1. The majority of the water in Camp Far West Ditch flows into Yankee Slough, which flows directly to the Bear River just upstream of the confluence with the Feather River.

    2. A small volume of water in Camp Far West Ditch flows into Camp Far West Reservoir via Renken, Forbes, and Church Canals. Camp Far West Reservoir is constructed on the Bear River.

Beneficial Uses

The Regional Board adopted the Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin, Fourth Edition – 1998 (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. State Board Resolution No. 88-63, a part of the Basin Plan, requires the Regional Board to assign the beneficial uses of municipal and domestic supply, to water bodies that do not have beneficial uses specifically identified in Table II-1 of the Basin Plan. Rock Creek, Dry Creek, and Coon Creek are not identified in the Basin Plan. Therefore, the municipal and domestic supply beneficial uses are applicable to Rock, Dry, and Coon Creeks.

In western Placer County and eastern Sutter County, Rock Creek, Dry Creek, and Coon Creek are tributary to Natomas Cross Canal and the Sacramento River. The discharge enters a section of the Sacramento River between the Colusa Basin Drain and I Street Bridge, the first body of water downstream of Rock Creek, via Natomas Cross Canal, for which the Basin Plan has identified existing beneficial uses. The beneficial uses of the Sacramento River, between the Colusa Basin Drain and I Street Bridge, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply, agricultural irrigation, water contact recreation including canoeing and rafting, non-contact water

recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, wildlife habitat, and navigation. Other beneficial uses identified in the Basin Plan apply to the Sacramento River, between the Colusa Basin Drain and I Street Bridge, including groundwater recharge, freshwater replenishment, and preservation of biological habitats of special significance (including the Sacramento San Joaquin Delta).

Rock Creek, Dry Creek, and Coon Creek are also tributary to Camp Far West Reservoir and the Bear River, via Camp Far West Ditch. The Bear River is the first body of water downstream of Rock Creek, for which the Basin Plan has identified existing beneficial uses. Table II-1 of the Basin Plan identifies existing and potential beneficial uses for the Bear River, including municipal and domestic supply, agricultural irrigation and stock watering, power supply, water contact recreation including canoeing and rafting, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to the Bear River, including groundwater recharge and freshwater replenishment. Upon review of the flow conditions, habitat values, and current uses of Coon Creek, Dry Creek, and Rock Creek, and applicability of the following factors: hydraulic continuity, aquatic life migration, existing and potential water rights, existing contact recreation, the beneficial uses identified in the Basin Plan for the Bear River are applicable to Coon Creek, Dry Creek, and Rock Creek.

The beneficial uses identified in the Basin Plan for the Sacramento River, between the Colusa Basin Drain and I Street Bridge, and for the Bear River are applicable to Coon Creek, Dry Creek, and Rock Creek, based upon the following:

> The State Water Resources Control Board (SWRCB) has recorded numerous water rights, for domestic uses, on Main Canal and downstream waters, the Sacramento River, the Bear River, and the Feather River, downstream of the discharge. Many of the downstream waterways are managed by irrigation districts and retain the domestic and irrigation beneficial uses. Nevada Irrigation District (NID) controls the flows in Dry Creek, Coon Creek, and Camp Far West Ditch. Staff of NID reported that one homeowner uses water from Camp Far West Ditch for in-home domestic use. NID requires the homeowner to purchase 5 gallons of drinking water per month. NID sells water from Coon Creek and Camp Far West Ditch for family garden use and pasture irrigation. Over a distance of approximately 25 miles on Camp Far West Ditch, there are 37 irrigation customers.
>
> Riparian Rights, for landowners along streams and rivers, are not recorded with the SWRCB and have precedence over other water rights.
>
> Rock Creek and Dry Creek are low flow streams and may provide groundwater recharge during periods of low flow. Groundwater is a source of drinking water. In addition to the existing

water uses, growth in the area downstream of the discharge is expected to continue, creating potential for increased domestic and agricultural uses of the water downstream of the discharge.

The discharge of treated wastewater to Rock Creek will not impact the power supply beneficial use of the downstream waters.

The WWTP discharges to Rock Creek, which is tributary to Dry Creek and Coon Creek. Water from Coon Creek is diverted to Camp Far West Ditch, Yankee Slough, Camp Far West Reservoir, the Bear River, and the Feather River. In western Placer County and eastern Sutter County Coon Creek is tributary to various sloughs and canals, Natomas Cross Canal, and the Sacramento River.

Hikers and campers, in the relatively uninhabited areas near the discharge point, Rock Creek, Dry Creek, upper Coon Creek, and Camp Far West Ditch have a reasonable expectation that those waters are as unpolluted as similar streams in the vicinity.

There is public access to Rock Creek, Dry Creek, Coon Creek, Camp Far West Ditch, Camp Far West Reservoir, the Bear River, the Feather River, the sloughs and canals that are downstream of Coon Creek, Natomas Cross Canal, and the Sacramento River. Several swimming and picnic areas were observed on the banks of Dry Creek and Coon Creek. Properties along Dry Creek and upper Coon Creek are single-family dwellings. The properties have relatively flat terrain that slopes down to the Creeks in their back yards. Public use is likely to increase as the population increases. Exclusion or restriction of public use is unrealistic.

Camp Far West Reservoir, the Bear River, the Feather River, and the Sacramento River are used extensively for contact and non-contact recreation.

The wastewater is discharged into Rock Creek, which flows into Dry Creek, Coon Creek, and downstream waters. The California Department of Fish and Game (DFG) has verified the presence of year-round warm water fisheries and cold-water fisheries for salmonids. Riparian habitats are also a by-product of drainages and canals and provide numerous habitats for birds and mammals.

Pursuant to the Basin Plan Tributary Rule, the cold and warm water habitat beneficial use designations of the Sacramento River and Bear River apply to Rock Creek, Dry Creek, and Coon Creek. The cold-water habitat designations necessitate that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. However, if at the time of monitoring, the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/l, the Discharger is not required to improve the dissolved oxygen concentration of the receiving stream.

The U.S. Fish and Wildlife Service has designated the streams and rivers in the Sierra foothills, including Rock Creek, Dry Creek, Coon Creek, and Camp Far West Ditch, to be potential habitat

for Red-Legged Frogs. DFG confirmed that the same drainages maintain habitat for Foothill Yellow-legged Frogs and Western Pond Turtles (species of concern) and a variety of macro invertebrates.

The area surrounding the watersheds containing Rock Creek, Dry Creek, upper Coon Creek, Camp Far West Ditch, and downstream waters, is sparsely populated and therefore provides a wide variety of habitat for wildlife.

The discharge of treated wastewater to Rock Creek will not impact the navigation beneficial use of the downstream waters.

In areas where the groundwater elevation is below the bottom of a stream, water from the stream will percolate to the groundwater. During dry weather in many places in California, flowing streams experience these conditions, thus providing groundwater recharge. Rock Creek and the downstream waters may contribute to groundwater recharge.

The discharge to Rock Creek contributes to the quantity and may impact the quality of the water in the downstream waters, including Camp Far West Reservoir, and the Bear, Feather, and Sacramento Rivers.

Upstream of the discharge from the WWTP, flows in Rock Creek and Dry Creek are both dependent on the flows released from upstream reservoirs; Rock Creek Lake and Halsey Afterbay, respectively. General information, from U.S. Geological Survey maps and site visits, indicates that Rock Creek and Dry Creek were intermittent streams prior to the year-round discharge. Based on the available information, Rock Creek and Dry Creek currently are low-flow or intermittent streams, in the absence of the discharge from the WWTP or the upstream reservoirs. The beneficial uses of Rock Creek and Dry Creek must be protected. However due to the low-flow/intermittent nature of the flows in the Creeks, no credit for receiving water dilution is available. Although the discharge flows may maintain aquatic habitat during low flow conditions, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flow and released flows help support cold-water aquatic life. Dry weather and low flow conditions occur primarily in the summer months but also occur throughout the year, particularly in low rainfall years. Significant dilution may occur during and after high rainfall events. However, the lack of available dilution during low flow periods results in more stringent effluent limitations to protect recreational uses, drinking water standards, agricultural water quality goals, and aquatic life.

At times, treated wastewater may be the main (or only) source of stream flow, with little or no dilution from natural flow, particularly in Rock Creek. The worst-case dilution in Rock Creek and Dry Creek is assumed to be zero to provide protection for the receiving water beneficial uses. The impact, of assuming zero dilution within the receiving water, is that discharge limitations based on acute and chronic toxicity must be end-of-pipe limits, rather than allowing for the dilution provided by the receiving water. End-of-pipe effluent limitations are included in the proposed Order.

Rock and Dry Creeks, prior to construction of the WWTP and upstream reservoirs, were low flow or intermittent streams during dry weather and contained water primarily during wet weather. Since construction of the upstream reservoirs and the WWTP, during dry weather and low flow periods, Rock Creek and Dry Creek may be dominated by effluent. During low flow periods, Rock and Dry Creeks provide little or no dilution for wastewater effluent discharged from the WWTP. The wastewater discharged from the WWTP into Rock Creek, and downstream waters, can be reused for the beneficial uses listed above, particularly municipal, domestic, contact recreation, agricultural irrigation, and aquatic life.

Wastewater Regionalization

The Discharger has actively pursued wastewater regionalization at the new City of Lincoln wastewater treatment plant for numerous Placer County treatment systems, including SMD-1. The City of Lincoln has fully supported the regionalization efforts by constructing an "expandable" wastewater treatment plant and constructing an oversized influent pipeline to the City limits. To date the Discharger has been successful in securing significant federal funding for planning, environmental review and preliminary design work. Environmental analysis, both CEQA and NEPA, have not yet begun. There is a sequential chain of events that must occur before the SMD-1 facility could reasonably be expected to tie-into the regional system. The new development of Bickford Ranch and the City of Auburn lie between SMD-1 and the SMD-1 service area. The Bickford Ranch development is being challenged on environmental issues. The City of Auburn has committed to wastewater regionalization, yet has not conducted a cost effective analysis. The Discharger contends that additional federal funding, which has not yet been appropriated, is necessary for regionalization to move forward. To date, none of the potential dischargers to the regional facility have made a financial commitment to construct the necessary discharge pipeline or to purchase capacity at Lincoln. The Discharger has, however asked the Regional Board to extend compliance dates for ammonia, nitrates, CTR constituents and equivalent to tertiary treatment based discharge limitations in The permit until a final determination has been made regarding wastewater regionalization. The Discharger has proposed that by 2 January 2008, based on the outcome of the environmental analysis, the status of additional federal funding, completion of a cost effective analysis and a regional wastewater commitment by Bickford Ranch and the City of Auburn, a determination can be made regarding whether wastewater regionalization is the appropriate means of achieving compliance for the SMD-1 wastewater treatment plant. If regionalization is selected, this information would be considered "new information" under federal regulations, 40 CFR 122.44 (l)(i)(B)(1), and the permit may be reopened for reconsideration of the compliance periods in accordance with applicable laws and regulations. After 2 January 2008, if wastewater regionalization is not the selected compliance alternative, the Discharger has agreed that there would be sufficient time remaining under the currently included compliance period to complete and implement measures to achieve full compliance with the permit.

Tertiary Treatment

The principal infectious agents (pathogens) that may be present in raw sewage are classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. The filtration process is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreation and food crop irrigation uses.

In the California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), the California Department of Health Services (DHS) has developed standards for the reuse or reclamation of wastewater. Title 22 requires, for reuse of wastewater for spray irrigation of food crops, parks, playgrounds, schoolyards, other areas of similar public access, and unrestricted contact recreation, that wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the total coliform organism levels in the effluent not exceed 2.2 MPN/100 ml (Most Probable Number per 100 milliliters), as a 7-Day Median. The required level of treatment is tertiary or equivalent. The Title 22 standards are the minimum wastewater treatment standards necessary to protect public health when wastewater is reused for beneficial uses. There are wastewater treatment processes that provide an equivalent pathogen removal, such as membrane technologies, which could also be utilized to protect the beneficial uses of the receiving stream.

Title 22 standards are not directly applicable to surface waters that receive wastewater and the subsequent reuse of the combined surface water/wastewater. However, the Regional Board finds that it is appropriate to require an equivalent level of treatment to the DHS reclamation criteria because Rock Creek and downstream waters are used for irrigation of agricultural land, for contact recreation and for domestic uses. The permit does not apply Title 22 standards to the discharge of wastewater from SMD1. However, in assessing the discharge standards necessary to the protect the site-specific beneficial uses of Rock Creek and Dry Creek, Title 22 standards were compared to the level of treatment required to protect public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Rock Creek and Dry Creek, as intermittent/low flow streams, are essentially the same as any other conveyance system (pipe or canal) when upstream flows are not present for dilution. DHS has determined that a specific level of treatment is required for reclaimed water delivered in dedicated pipes or canals. Therefore, to protect public health, the same level of treatment is required for water that is delivered in a streambed for the same uses.
It is not practicable to sample wastewater effluent for individual viruses and parasites. Therefore, the number of bacteria, measured as Total Coliform Organisms, in wastewater is an indicator of the effectiveness of the entire treatment train and the effectiveness of pathogen removal. A tertiary or equivalent treatment system is able to achieve a Total Coliform Organism level of 2.2 MPN/100 ml as a 7-Day Median. As an “indicator”, solely complying with the total coliform limitation does not indicate that a “tertiary” level of treatment has been provided. The method of treatment is not prescribed in The permit; however, wastewater must be treated to a level equivalent to the tertiary standards recommended by DHS.

As another indicator of effective treatment, a tertiary or equivalent treatment system is also capable of reliably achieving turbidity levels of 2 NTU (Nephelometric Turbidity Units) as a daily average. Failure or bypass of the filtration system, and corresponding reduced removal of viruses, would normally result in an increase in the number of particles in the effluent and higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations.

In addition to coliform testing, a turbidity effluent limit has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. In addition, tertiary treatment processes are able to reduce Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) to lower levels than can be achieved with secondary treatment processes alone. The 30-Day Average BOD and TSS effluent limits for secondary treatment have been revised to 10 mg/l, which is technically based on the capability of a tertiary system.

The requirement to provide tertiary treatment, or equivalent, is based on Regional Board staff's documentation of contact recreation, food crop irrigation and municipal and domestic uses of the receiving stream. Tertiary or equivalent treatment is consistent with the technical analysis conducted to develop the reclamation requirements of California Code of Regulations Title 22, and recommendations from the California Department of Health Services (DHS) contained in *Wastewater Disinfection for Health Protection* (1987), *Technical Justification for the Dilution Ratio for Secondary Effluent* (SDHS), the *Uniform Guidelines for the Disinfection of Wastewater* (1987) and the *Department of Health Services Recommendations for Waste Discharge Requirements* (1 July 2003).

Coagulation and filtration are also effective processes for reducing concentrations of some metals and other pollutants from the waste stream. Discharge of unfiltered water may result in an increase in violations of effluent limitations for some metals that are primarily based on toxicity to aquatic life.

Tertiary treatment, or equivalent, is necessary to protect the beneficial uses of the receiving stream. The Discharger's wastewater treatment system provides tertiary treatment. However, flows greater than 3.5 mgd are routed around the gravity filters to the chlorine contact basins. However, wet weather flows, due to inflow and infiltration (I/I), have exceeded 8 mgd. Currently, flows in excess of 3.5 mgd will receive a secondary level treatment but be routed around the gravity filters and flow directly to the chlorine contact basins. Wastewater discharged during periods of high flow is some combination of tertiary and secondary. The permit requires tertiary treatment, or equivalent, for all flows less than 3.5 mgd and utilization of the coagulation and filtration processes to the maximum extent practicable during wet weather.

Prior to permit renewal, anticipating a requirement to provide full tertiary treatment, the Discharger consulted with DHS staff. In a 15 July 2003 letter to Regional Board staff regarding conditions at SMD1 specifically, after their review of costs to expand to year-round tertiary and the high influent flow rates, DHS noted several exceptions to the need for tertiary treatment at SMD1 as follows:

"1. The plant is subject to very high flow rates during, and immediately following storm events. Plant flow that exceeds the capacity of the filters can be allowed to bypass the filtration process during these events, provided the filter capacity is at least 30% greater than the permitted average dry weather flow.

2. A 30-day median coliform bacteria count of 2.2 MPN/100 ml can be allowed during the cold weather season. This season can be defined either on the basis of months (e.g., November 1 through April 30), or by receiving water temperature. If you decide to implement the latter, we recommend that the 'cold weather season' be defined as beginning when the seven day median receiving water temperature first falls below 60°F, and ending when the seven-day median receiving water temperature first rises above 60°F."

A discharge in accordance with the DHS recommendation will not protect contact recreation, food crop irrigation and domestic and municipal beneficial uses during periods when the receiving water temperature is less than 60^{o} F and treatment plant effluent flows exceed 3.5 mgd. The beneficial uses of the receiving waters immediately downstream of the discharge have been well documented. There is no documentation that water contact recreational activities cease at 60^{o} F, to the contrary the nearby American River has well documented periods of contact recreational activity when water temperatures are below 60^{o} F. The discharge of blended secondary effluent, compared to a full tertiary discharge, will result in the discharge of additional pollutants. The assessment of compliance with CTR standards and water quality objectives was based on tertiary treatment, and the blended discharge will likely not comply, threatening to degrade numerous beneficial uses, including the protection of aquatic life and drinking water. To protect the public health for confirmed downstream domestic uses, such as the City of Jackson, DHS has recommended that tertiary plus 20-to-1 dilution is necessary to protect domestic beneficial uses. Domestic uses have been documented to exist downstream of SMD-1. A tertiary level of treatment, or equivalent, is necessary to protect the beneficial uses of the receiving stream.

The Discharger's wastewater system has a high wet weather peaking factor, allowing elevated wet weather flows into the collection system. Reduction of I/I flows into the collection system will reduce the need for additional filtration. The permit includes a Provision that requires the Discharger to complete and implement an effective I/I reduction plan.

The permit requires that the Discharger may not discharge unfiltered wastewater in any amount, unless the influent flow is greater than 3.5 mgd and the 7-Day Median receiving water temperature is less than 60 °F. The permit contains effluent limitations for tertiary treated wastewater when flow is less than or equal to 3.5 mgd for Total Coliform Organisms, BOD, TSS, and Turbidity. When flow is greater than 3.5 mgd and Temperature is less than 60 °F as a 7-Day Median, The permit contains an effluent limitation for Total Coliform Organism of 2.2 MPN/100 ml as a 30-Day Median as recommended by DHS. To accommodate the discharge of commingled tertiary/secondary wastewater, The permit also contains interim effluent limitations for BOD, TSS, and turbidity that are less stringent than tertiary limits.

As recommended by DHS, when discharging commingled wastewater, additional weekly monitoring is required for Total Coliform Organisms, Fecal Coliform Organisms, *Escherichia coli*, and Salmonella bacteria. In order to determine when the temperature of the receiving water has achieved less than 60 °F as a 7-Day Median, additional temperature monitoring will be necessary. The existing flow measurements in Rock Creek, Dry Creek, and plant effluent flow monitoring are not adequate for high flows and The permit requires they be upgraded to accurately measure dilution flow ratios while discharging less than tertiary quality effluent. To determine compliance with the lesser treatment requirements recommended by DHS, additional flow measurement will be required for the effluent from the plant, effluent from the gravity filters, flow to the chlorine contact basins, and flows in Rock and Dry Creeks.

The permit contains Effluent Limitations less stringent than full tertiary treatment limits during wet weather flow periods when the receiving water temperature is less than 60^{o} F, as recommended by DHS. Tertiary treatment, or equivalent, is necessary to protect the designated beneficial uses of contact recreation, food crop irrigation and domestic and municipal supply. Similar local communities, some with higher wet weather peaking factors, Auburn, Placerville, El Dorado Hills and Cameron Park all provide, or are in the process of completing projects to provide, full tertiary treatment for wet weather flows. Upon expansion, the Regional Board finds that providing best practicable treatment or control (BPTC) of the discharge will require tertiary treatment for all flows.

Until the wastewater treatment facility is expanded or closed to tie into the Regional Wastewater Plant, the permit allows a treatment level less than tertiary, or equivalent, during periods of high flow and cold temperature. The permit requires that the Discharger conduct an analysis to determine if bypassing filtration during these limited periods provides BPTC in accordance with State Board Resolution No. 68-16, the antidegradation policy. The BPTC analysis will be due prior to making a decision of whether regionalization is feasible and will require analysis of at least the following:

- Whether 20-to-1 dilution (receiving stream flows to effluent flow) exists during wet weather periods,
- Identification and prioritization of wet weather flows in a comprehensive I/I reduction program to assess the amount of flow reduction that can be expected to be achieved,
- A flow equalization analysis to contain the “excess” wet weather flows,
- An analysis of tertiary treatment design parameters for dry and wet weather flow rates to determine the actual current dry and wet weather design of the filtration system,
- A treatability analysis to determine what treatment train will be necessary to comply with CTR limitations,
- An analysis of the SMD-1 system, what parameters make it, the service area and the downstream beneficial uses unique to receive relaxed wet weather effluent limitations in providing BPTC,
- A complete and through cost analysis of maximizing I/I, providing additional treatment to comply with CTR based limitations, adding equalization basins, building additional filters, tying into the regional wastewater plant and any other alternatives evaluated. The cost analysis must

contain a detailed basis for the total costs and an assessment of monthly per household/increases for each alternative.

If wastewater regionalization is not the selected alternative and based on the findings of the BPTC analysis, the permit may be reopened and additional equivalent to tertiary discharge limitations may be added to protect the beneficial uses of the receiving waters.

The Basin Plan's surface water quality bacteria objective of 200 MPN/100 ml, for fecal coliform organisms, is based on Federal Standards for contact recreational use of surface waters. U.S. EPA, in the *Ambient Water Quality Criteria for Bacteria* (1986), estimates that compliance with the fecal coliform fresh surface water criteria of 200 MPN/100 ml will result in approximately eight illnesses per 1,000 swimmers. In a 28 September 2000 letter to Regional and District Engineers at DHS, the DHS stated that "Federal Standards for water quality where recreational bathing may occur were developed for freshwaters which are not directly influenced by sewage discharges (treated or untreated)." The DHS has documented the reduction of pathogens from various wastewater treatment processes. According to DHS; providing a secondary disinfected quality achieves a 1 to 4 log reduction and a tertiary disinfected quality achieves a 4 to 6 log reduction of viruses from raw sewage. The DHS projected that approximately one illness per 220 bathers would occur from recreation contact in secondary disinfected wastewater which drops to a more acceptable level of approximately one illness per 1,000 bathers with tertiary treatment.

The permit contains Effluent Limitations more stringent that the Basin Plan objective for bacteria and requires a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water in addition to contact recreation of municipal and domestic uses, and food crop irrigation. Although the Discharger provides tertiary treatment except during high flow conditions, in accordance with California Water Code, Section 13241, the Regional Board considered the following:

a. As stated above, Regional Board staff have site-specifically identified the past, present and probable future beneficial uses of the receiving stream to include municipal and domestic uses, contact recreation, and food crop irrigation.

b. The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California Department of Health Services (DHS). The DHS has also stated that domestic or municipal uses are not protected by a tertiary level of treatment.

c. In conformance with Section 101(a)(2) of the Clean Water Act (CWA), "fishable and swimmable" water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area. In recommending to allow partial filtration system bypass during periods when the receiving stream is less than 60^{o} F, the DHS

is stating that it is not reasonable that the receiving waters will be used for recreational purposes and a "swimmable" condition need not be achieved under certain conditions. The discharge of a less than tertiary quality will also result in the discharge of additional pollutants which could degrade aquatic life uses of the receiving stream. Implementation of a tertiary or equivalent level of treatment will achieve compliance with the CWA goals of "fishable and swimmable" waters on a year round basis.

d. The economic impact of requiring an increased level of treatment was considered.

The Discharger has estimated that the construction cost to achieve year-round filtration, with the same type of filters already at SMD1, is approximately $1,000,000 per million gallons per day of additional capacity, or a minimum of $5,000,000. This assumption is based on average dry weather design flow rates, utilizing the operational range of treatment systems at peak wet weather flow conditions, installation of sufficient additional filters could cost significantly less than projected by the City. Peak wet weather flow rate is the problematic parameter at this facility with respect to providing tertiary treatment. Other wastewater dischargers in the area successfully utilize more than one type of filtration. The costs to add the "same type" of filters at SMD-1 eliminates any opportunity for cost savings.

Regional Board and State Board staff gathered information relating to the City of Auburn Wastewater Treatment Plant improvements. The City of Auburn installed new continuous backwash Dynasand Filters to handle 6 mgd of flow. The cost of the filters and associated infrastructure was $1.9 million. Included in the cost were concrete structures, pumps, a rapid mix tank, a chemical building, electrical work, piping, and the filters themselves. Accounting for inflation, the cost today would be approximately 20% higher, resulting in a cost of $2.2 - $2.3 million for filters and associated structures for a flow of 6 mgd. The approximate cost per million gallons would be $370,000 – $380,000. The initial costs are less with the Dynasand Filters but operation and maintenance costs are higher than other filters.

The cost of additional filtration is only necessary to offset the cost to treat wet weather flows above 3.5 mgd. Reducing I/I flows would reduce the cost of additional filters. The cost of reducing I/I and the associated reduced need for additional filters could not be assessed with the available information.

The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting domestic uses, the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact.

The Discharger has not assessed the means of compliance with effluent limitations for individual pollutants. In addition to pathogen removal to protect irrigation and recreation,

tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for potentially expensive advanced treatment.

e. The need to develop housing in the area will not be significantly impacted by the requirement for tertiary treatment. The level of tertiary treatment is not being increased over that which is already being provided by the Discharger.

f. It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

The Regional Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives") that specifies that the Regional Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives*." This Policy complies with 40 CFR 122.44(d)(1). With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA's published water quality criteria, a proposed state criterion (*i.e*., water quality objective), or an explicit state policy interpreting its narrative water quality criteria (*i.e*., the Regional Board's "Policy for Application of Water Quality Objectives")(40 C.F.R. 122.44(d)(1) (vi) (A), (B) or (C)). The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*". The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The beneficial uses include municipal and domestic supply, agricultural irrigation supply, water contact and non-contact recreation and aquatic habitat and migration. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Board may apply limits more stringent than MCLs. When a reasonable potential exists for exceeding a narrative objective, Federal Regulations mandate numerical effluent limitations and the Basin Plan narrative criteria clearly establish a procedure for translating the narrative objectives into numerical effluent limitations.

Mixing Zone And Dilution Credits

In establishing Effluent Limitations for constituents listed in the NTR and CTR, the RWQCB may grant mixing zones and dilution credits to dischargers in accordance with provisions of Section 1.4.2 of the

SIP. The applicable priority pollutant criteria and objectives are to be met throughout a water body except within any mixing zone granted by the RWQCB. Mixing zone, dilution credit, and other terms used in their calculation are defined in the SIP as follows:

DILUTION CREDIT is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water. (Represented as D in calculations of effluent limitations.)

MIXING ZONE is a **limited** volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

COMPLETELY-MIXED DISCHARGE condition means not more than 5 percent difference, accounting for analytical variability, in the concentration of a pollutant exists across a transect of the water body at a point within two stream/river widths from the discharge point.

INCOMPLETELY-MIXED DISCHARGE is a discharge that contributes to a condition that does not meet the meaning of a completely-mixed discharge condition.

DILUTION RATIO is the critical low flow of the upstream receiving water divided by the flow of the effluent discharged.

1Q10 is the lowest flow that occurs for one day with a statistical frequency of once every 10 years.

7Q10 is the average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years.

Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some, or no priority pollutants in a discharge. Before establishing a mixing zone and a dilution credit for a discharge, it must first be determined if, and how much (if any), receiving water is available to dilute the discharge. In determining the appropriate available receiving water flow, the RWQCB may take into account actual and seasonal variations of the receiving water and the effluent. For example, the RWQCB may prohibit mixing zones during seasonal low flows and allow them during seasonal high flows.

The SIP specifies that "*A mixing zone shall be as small as practicable*", and includes a list of requirements for allowing a mixing zone, information requirements, and instructions for calculating dilution ratios. The SIP also states "*The application for the* [NPDES] *permit shall include, to the extent feasible, the information needed by the RWQCB to make a determination on allowing a mixing zone, including calculations for deriving the appropriate receiving water and effluent flows, and/or the results of a mixing zone study. It the results of the mixing zone study are unavailable by the time of permit issuance/reissue, the RWQCB may establish interim requirements*…" The approach to making a mixing zone determination also depends on whether a discharge is completely-mixed or incompletely-mixed with the receiving water.

The SIP states "*Dilution credits and mixing zones for incompletely mixed discharges shall be considered by the RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate*." The Discharger has not completed a mixing zone study for SMD1.

The SIP states "*For completely-mixed discharges, as determined by the RWQCB and based on information provided by the discharger, the amount of receiving water available to dilute the effluent shall be determined by calculating the dilution ratio (i.e., the critical receiving water flow divided by the effluent flow) using the appropriate flows in Table 3. In no case shall the RWQCB grant a dilution credit that is greater than the calculated dilution ratio.*" As shown in Table 3 of the SIP, to calculate the dilution ratios, the 1Q10 and 7Q10 must be calculated from sufficient data provided by the Discharger. The Discharger has not provided sufficient data for the 1Q10 and 7Q10 calculations.

The Discharger has not submitted the necessary information to make a mixing zone and dilution credit determination. In addition, the receiving water for SMD1 (Rock Creek) is an effluent dominated water body. When the effluent flow exceeds the flow of Rock Creek, it appears that a mixing zone allowance would violate two requirements of the SIP, which states in Section 1.4.2.2.A.:

> "*A mixing zone shall <u>not</u>:*
>
> *(1) compromise the integrity of the entire water body; ...*
>
> *(10) dominate the receiving water body...*"

Without the information necessary to determine whether a mixing zone and dilution credits are applicable and with the information that Rock Creek is effluent dominated, at times, Regional Board staff must conclude that a dilution credit and mixing zone are not appropriate (D = 0).

Effluent Limits

National and California Toxics Rules
U.S. EPA adopted the *National Toxics Rule* on 5 February 1993 and the *California Toxics Rule* on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP), which contains guidance on implementation of the *National Toxics Rule* (NTR) and the *California Toxics Rule* (CTR).

Excursions Above Narrative and Numeric Water Quality Standards
Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. To implement requirements of the SIP, the Discharger's

Report of Waste Discharge contained information as to whether the levels of NTR, CTR, or other pollutants in the discharge from the WWTP would cause or contribute to an in-stream excursion above a water quality or Basin Plan numeric or narrative objective. The Discharger collected the required samples, submitted them for analysis, and once the results were complete, submitted the results in a report titled "*Effluent and Receiving Water Quality Assessment for the Sewer Maintenance District No. 1 Wastewater Treatment Plant*", dated 28 February 2003. Tables 1 through 6 contain a summary of the laboratory analytical results contained in the report. Based on the Discharger's information (also including monthly Monitoring Reports), Regional Board staff has calculated effluent limitations and included them in the proposed Order. Effluent Limitations are discussed in further detail below.

Basin Plan Numeric Water Quality Objectives
Section 13263.6(a), California Water Code (CWC), requires that "*the regional board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW* [Publicly Owned Treatment Works] *for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C.* [United States Code] *Sec. 11023)* [EPCRKA] *indicate as discharged into the POTW, for which the state board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective."*

Section III of the Basin Plan contains water quality objectives for the Central Valley Region. Table III-1, Trace Element Water Quality Objectives, contains numeric water quality objectives for the Sacramento River from Keswick Dam to the I Street Bridge, for Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, and Zinc. The discharge from the WWTP is discharged to Rock Creek, an eventual tributary to the Sacramento River between Keswick Dam and the I Street Bridge.

In the Basin Plan, Table III-3, Electrical Conductivity and Total Dissolved Solids, contains numeric water quality objectives for the Sacramento River at the I Street Bridge, for Electrical Conductivity. The numeric objectives are 240 micromhos/cm (50 percentile) or 340 micromhos/cm (90 percentile).

Table III-3 also contains numeric water quality objectives for Electrical Conductivity in the Feather River from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Rock Creek is also eventually tributary to the Feather River between the Fish Barrier Dam and the Sacramento River. The numeric objective is 150 micromhos/cm (90 percentile).

The discharge into Rock Creek in central Placer County travels many miles of tributary waters, through western Placer County, eastern Sutter County, and northern Sacramento County before entering the Feather and Sacramento Rivers. It is not likely that the discharge from the WWTP into Rock Creek will impact the concentrations of Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, and Zinc, and the Electrical Conductivity in the Sacramento River or the Electrical Conductivity in the Feather River. Available effluent quality data indicate that none of these constituents have a reasonable potential to

cause or contribute to an excursion above any numeric water quality objectives included in the Basin Plan for the Sacramento and Feather Rivers. Therefore, Effluent Limitations pursuant to CWC Section 13263.6(a) are not proposed for Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc, and Electrical Conductivity.

Required Effluent Limitations

Federal regulations also require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the following:

A. Current Mercury levels in the Sacramento-San Joaquin Delta;

B. Technology-based Effluent Limits, Title 22 equivalent, and tertiary water treatment objectives for Bacteria (Total Coliform Organisms), Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS), and Turbidity;

C. The Basin Plan narrative Oil and Grease Water Quality Objective;

D. The Basin Plan numeric pH Water Quality Objective;

E. The Basin Plan narrative Pesticide Water Quality Objective, for Persistent Chlorinated Hydrocarbon Pesticides, including 2,4-D, DDE, Dalapon, Dinoseb, Endosulfan, Heptachlor Epoxide, and 2,4,5-TP (Silvex);

F. The Basin Plan narrative Settleable Material Water Quality Objective for Settleable Solids;

G. The Basin Plan narrative Toxicity Water Quality Objective for Survival of Aquatic Organisms;

H. The Basin Plan narrative Toxicity Water Quality Objective for Aluminum, Ammonia, Atrazine, Chlorine Residual, Phthalate Esters (PAEs), and Tributyltin;

I. The California Department of Health Services (DHS) Drinking Water Standards Primary Maximum Contaminant Levels (PMCLs) for Alachlor, Nitrate, and Nitrite, and the DHS Drinking Water Standards Secondary Maximum Contaminant Levels (SMCLs) for Manganese and Methyl Tert Butyl Ether (MTBE);

J. CTR criteria for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, Polychlorinated Biphenyls (PCBs), Silver, and Zinc; and

K. Other drinking water criteria for Chloroform.

Effluent Limitations for Alachlor, Aluminum, Ammonia, Atrazine, Bacteria, Bis(2-ethylhexyl)phthalate, BOD, Bromodichloromethane, Chlorine Residual, Chloroform, Copper, Dioxins and Furans, Lead, Manganese, Mercury, MTBE, Nitrate, Nitrite, Oil and Grease, PAEs, PCBs, pH, Persistent Chlorinated Hydrocarbon Pesticides, Settleable Solids, Silver, Survival of Aquatic Life, TSS, Tributyltin, Turbidity, and Zinc are included in the proposed Order.

Concentration-based Effluent Limitations, and in accordance with the Code of Federal Regulations, 40 CFR 122.45(f), mass-based Effluent Limitations are included for Alachlor, Aluminum, Ammonia, Atrazine, Bis(2-ethylhexyl)phthalate, BOD, Bromodichloromethane, Chlorine Residual, Chloroform, Copper, Dioxins and Furans, Lead, Manganese, Mercury, MTBE, Nitrate, Nitrite, Oil and Grease, PAEs, PCBs, Persistent Chlorinated Hydrocarbon Pesticides, Silver, TSS, Tributyltin, and Zinc. Mass-based limitations for these constituents (except Mercury; see below) are calculated using the equation:

(Concentration-based Effluent Limitation) x (8.345) x (Average Daily Flow) = Mass-based Effluent Limitation

$$X \text{ mg/l} \times 8.345 \times 2.18 \text{ MGD} = Y \text{ lbs/day}$$

Where:
Average Daily Flow = 2.18 MGD
8.345 is the conversion factor to convert mg/l and MGD into lbs/day
X = Concentration-based Effluent Limitation
Y = Mass-based Effluent Limitation

Mercury

The CTR Human Health criterion for Mercury (expressed as total recoverable metal) in waters that are sources of drinking water (consumption of water and aquatic organisms) is 0.05 µg/l as a 30-day average. In the Code of Federal Regulations 40 CFR Part 131, U.S. EPA acknowledges that human health criteria may not be protective of some aquatic or endangered species. In the CTR, U.S. EPA reserved the Mercury criteria for fresh water and aquatic life and may adopt new criteria at a later date.

The Basin Plan contains a list (known as the 303(d) List) of Water Quality Limited Segments (WQLSs) that "are those sections of lakes, streams, rivers, or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate effluent limitations for point sources". The Basin Plan goes on to state, "Additional treatment beyond minimum federal requirements will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment."

Wastewater from the treatment plant discharges to Rock Creek and eventually flows into the Sacramento River, which then flows to the Sacramento-San Joaquin Delta. The Sacramento-San Joaquin Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act, because of

Mercury. Because the Sacramento-San Joaquin Delta has been listed as an impaired water body for Mercury, the discharge must not cause or contribute to an increase of Mercury levels. Section 1.3 of the SIP requires establishment of an Effluent Limitation when the detected concentration exceeds an applicable criterion or objective.

Effluent monitoring data recently submitted by the Discharger (see Table 1) showed total recoverable Mercury in twelve samples at concentrations of 0.00162, 0.00174, 0.00195, 0.00220, 0.00248, 0.00255, 0.0027, 0.0034, 0.00350, 0.0071, 0.0074, and 0.00987 µg/l. The reported concentrations of Mercury do not exceed the CTR Human Health criterion, therefore, a concentration-based Effluent Limitation is not proposed. However, the Effluent does contain a mass of Mercury, which may contribute to an increase in Mercury in the Sacramento-San Joaquin Delta. Therefore, a mass-based final Effluent Limitation for Mercury, in lbs/day, is included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The mass limit for Mercury is calculated using the maximum flow rate and maximum detected concentration [(*X* mg/l) x (8.345) x (Max Flow Rate in MGD)] = *Y* lbs/day). This limitation is based on maintaining the Mercury loading at the current level until a Total Maximum Daily Load (TMDL) can be established and U.S. EPA develops Mercury standards that are protective of human health.

The highest average monthly flow reported within the last twelve months was 2.56 MGD in December 2002. Using the highest average monthly flow of 2.56 MGD and the maximum detected Mercury concentration of 0.00987 µg/l (0.00000987 mg/l), the approximate maximum mass of Mercury discharged monthly is 0.00021 lbs/day as a monthly average:

Mass-based Effluent Limitation for Mercury:

$\Rightarrow$ 0.00000987 mg/l x 8.345 x 2.56 MGD $\cong$ 0.00021 lbs/day as a Monthly Average

The Mercury Effluent Limitation is based on current effluent concentrations. A schedule is not necessary for the Discharger to achieve compliance. If U.S. EPA develops new water quality standards for Mercury, the proposed Order may be reopened and new Effluent Limitations added and/or the existing Effluent Limitation adjusted, as appropriate.

Technology-based Effluent Limits and Title 22 - Total Coliform Organisms, BOD and TSS, and Turbidity

Title 22 equivalence and tertiary water treatment standards are described in Findings above and are applicable to this discharge. The existing gravity filters are only able to adequately filter flows up to 3.5 MGD and, consequently, the WWTP is currently unable to provide year-round tertiary treatment.

When flows > 3.5 MGD bypass the gravity filters, the discharge will be some combination of tertiary and secondary treated wastewater. Effluent limitations for BOD, TSS, and Turbidity are also impacted by a reduction in treatment. The proposed Order contains two sets of Effluent Limitations for Total

Coliform Organisms, BOD and TSS, and Turbidity; for flows ≤ 3.5 MGD and for flows > 3.5 MGD (and when receiving water temperature < 60 °F as a 7-Day Median).

Based on DHS' written opinions, the proposed Order also contains additional weekly receiving water monitoring during bypass events, for Total Coliform Organisms, Fecal Coliform Organisms, *Escherichia coli*, and Salmonella Organisms. Additional receiving water temperature monitoring will also be required between 1 October and 30 May. Upgraded flow monitoring equipment will be required for the receiving streams, Rock Creek and Dry Creek. Additional flow monitoring will be required for the receiving streams, plant effluent, effluent from the gravity filters, and flow to the chlorine contact basins.

Effluent Limitations for Total Coliform Organisms, BOD and TSS, and Turbidity are described as follows:

Total Coliform Organisms
Existing Order No. 97-113 contains Effluent Limitations of 2.2 MPN/100 ml as a Monthly Median and 23 MPN/100 ml as a Daily Maximum from 1 May through 31 October, and 23 MPN/100 ml as a Monthly Median and 230 MPN/100 ml as a Daily Maximum from 1 November through 30 April.

Title 22 of the California Code of Regulations states that reclaimed water shall be considered adequately disinfected for spray irrigation purposes if the median value of Total Coliform Organisms does not exceed 2.2 MPN/100 ml for the last 7 days for which analyses have been completed, the number of total coliform bacteria does not exceed 23 MPN/100 ml in more than one sample in any 30 day period, and no sample shall exceed 240 MPN/100 ml. When flow ≤ 3.5 MGD, to provide Title 22-equivalent waters, the proposed Order contains final Effluent Limitations of 2.2 MPN/100 ml as 7-Day Median, 23 MPN/100 ml as a Daily Maximum that must not be exceeded more than once in 30 day period, and 240 MPN/100 ml as a Daily Maximum.

When flows are greater than 3.5 MGD and the 7-Day Median temperature of the receiving water < 60 °F, the proposed Order contains interim Effluent Limitations of 2.2 MPN/100 ml as a 30-Day Median and 23 MPN/100 ml as a Daily Maximum that must not be exceeded more than once in 30 day period, and 240 MPN/100 ml as a Daily Maximum.

Effluent Limitations for Total Coliform Organisms:
⇒ 2.2 MPN/100 ml as a 7-Day Median
⇒ 23 MPN/100 ml as a Daily Maximum, may be exceeded only once in 30 days
⇒ 240 MPN/100 ml as a Daily Maximum

Interim Effluent Limitations for flows > 3.5 MGD for Total Coliform Organisms:
⇒ 2.2 MPN/100 ml as a 30-Day Median
⇒ 23 MPN/100 ml as a Daily Maximum, may be exceeded only once in 30 days
⇒ 240 MPN/100 ml as a Daily Maximum

BOD and TSS

The Federal Water Pollution Control Act was adopted in 1972. The Act created the NPDES system for permitting wastewater discharges. The first NPDES permits focused on control of traditionally regulated pollutants, with emphasis on BOD, TSS, pH, oil and grease, and some metals, by requiring the use of Best Practicable Control Technology (BPT). The Act included a deadline for all facilities to be compliance with BPT and also established a compliance deadline for installing Best Available Technology (BAT). Most permits issued to industrial facilities contained effluent limits based on Best Professional Judgment (BPJ). In 1977, the Clean Water Act was adopted, which shifted emphasis from controlling conventional pollutants to controlling toxic discharges and extended the compliance deadline for BAT. The conventional pollutants (BOD, TSS, pH, fecal coliform organisms, and oil and grease) controlled by BPT in the first round of permits were now subject to a new level of control termed Best Conventional Pollutant Control Technology (BCT).

When developing effluent limits for an NPDES permit, pollutants controlled by BAT and BCT requirements generally have Technology-Based effluent limits. Technology-Based effluent limits for POTWs are derived from secondary treatment standards. Municipal wastewater is amenable to biological treatment. The biological component of a municipal treatment plant is termed secondary treatment and is usually preceded by simple settling (primary treatment). U.S. EPA evaluated performance data from secondary treatment facilities and established performance standards. Secondary treatment standards for both BOD and TSS are 30 mg/l as a 30-Day Average and 45 mg/l as a 7-Day Average, with an 85% removal rate.

Tertiary treatment is generally considered to include primary and secondary treatment, with coagulation and filtration. U.S. EPA has not established performance standards for tertiary treatment. However, based on observed treatment capabilities, tertiary treatment is able to achieve both BOD and TSS levels of 10 mg/l as a Monthly Average, 15 mg/l as a Weekly Average, and 25 mg/l as a Daily Maximum, with a minimum 85% removal rate.

Existing Order No. 97-113 contains seasonal Effluent Limitations of 10 mg/l (Monthly Average), 15 mg/l (Weekly Average), and 25 mg/l (Daily Maximum) for both BOD and TSS from 1 May through 31 October. From 1 November through 30 April, the existing Order contains Effluent Limitations of 20 mg/l (Monthly Average), 30 mg/l (Weekly Average), and 50 mg/l (Daily Maximum) for both BOD and TSS.

To provide Title 22 equivalent waters the proposed Order contains final Effluent Limitations of 10 mg/l (Monthly Average), 15 mg/l (Weekly Average), and 25 mg/l (Daily Maximum), with a minimum 85% removal rate, for both BOD and TSS, when flow $\leq$ 3.5 MGD. These Limitations are based on the design technical capability of tertiary treatment systems.

When flows are greater than 3.5 MGD, the gravity filters will be bypassed and the discharge from the plant will be some combination of tertiary and secondary treated wastewater. When flow > 3.5 MGD

and the 7-Day Median temperature of the receiving water < 60 °F, the proposed Order contains interim Effluent Limitations of 20 mg/l (Monthly Average), 30 mg/l (Weekly Average), and 50 mg/l (Daily Maximum), with an 85% removal rate. These effluent limits are midway between secondary and tertiary treatment capabilities.

Final Concentration-based Effluent Limitations for BOD and TSS:
⇒ 10 mg/l as a Monthly Average
⇒ 15 mg/l as a Weekly Average
⇒ 25 mg/l as a Daily Maximum
⇒ 85% removal rate

Interim Concentration-based Effluent Limitations for flows > 3.5 MGD for BOD and TSS:
⇒ 20 mg/l as a Monthly Average
⇒ 30 mg/l as a Weekly Average
⇒ 50 mg/l as a Daily Maximum
⇒ 85% removal rate

Mass-based Effluent Limitations for both BOD and TSS are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The BOD and TSS mass limits are calculated using the concentration-based Effluent Limitations and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitations for BOD and TSS:
⇒ 10 mg/l x 8.345 x 2.18 MGD ≅ 182 lbs/day as a Monthly Average
⇒ 15 mg/l x 8.345 x 2.18 MGD ≅ 273 lbs/day as a Weekly Average
⇒ 25 mg/l x 8.345 x 2.18 MGD ≅ 455 lbs/day as a Daily Maximum
⇒ 85% removal rate

Interim Mass-based Effluent Limitations for flows > 3.5 MGD for BOD and TSS:
⇒ 20 mg/l x 8.345 x 2.18 MGD ≅ 364 lbs/day as a Monthly Average
⇒ 30 mg/l x 8.345 x 2.18 MGD ≅ 546 lbs/day as a Weekly Average
⇒ 50 mg/l x 8.345 x 2.18 MGD ≅ 910 lbs/day as a Daily Maximum
⇒ 85% removal rate

Turbidity

Existing Order No. 97-113 contains seasonal Effluent Limitations of 2 NTU as a Monthly Average and 5 NTU as a Daily Maximum from 1 May through 31 October. The existing Order contains no Turbidity limitation between 1 November and 30 April.

Title 22 criteria for filtered wastewater require that Turbidity not exceed; (a) an average of 2 NTU in a 24-Hour period, (b) 5 NTU more than 5% of the time in a 24-Hour period, and (c) 10 NTU at any time.

To provide Title 22 equivalent water the proposed Order contains final Effluent Limitations of 2 NTU as a 24-Hour Average and a Daily Maximum between 5 NTU and 10 NTU, as described above, when flow ≤ 3.5 MGD.

In the interim, the proposed Order contains no limitations when flow > 3.5 MGD and the 7-Day Median temperature of the receiving water < 60 °F.

Final Effluent Limitations for Turbidity:
⇒ 2 NTU as a 24-Hour Average
⇒ 5 NTU to be exceeded no more than 5% of the time within a 24-hour period
⇒ 10 NTU as a Daily Maximum

There are also year-round Receiving Water Limitations for Turbidity based on the Basin Plan water quality objective.

Basin Plan Water Quality Objective for Oil and Grease
The Basin Plan includes a water quality objective for oil and grease in surface waters, which states "*Waters shall not contain oils, greases, waxes, or other materials in such concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*."

The term "grease" as commonly used in relation to food, food processing, and restaurants, includes fats, oil, and waxes. Grease content is determined by laboratory extraction of a waste sample with trichlorotrifluoroethane. Other extractable waste oils and greases include mineral oils, such as kerosene and lubricating and road oils. Fats and oils are compounds of alcohol or glycerin with fatty acids, and are composed of carbon, hydrogen, and oxygen in varying proportions. Fats and oils enter wastewater as butter, lard, margarine, vegetable fats and oil, meat, seeds, nuts, and certain fruits. Kerosene, lubricating and road oils are derived from petroleum and coal tar and are made up essentially of carbon and hydrogen. These oils reach the sewers from shops, garages, and streets. Greases and oils tend to coat surfaces, interfering with biological action and causing maintenance problems within WWTPs.

The Federal Water Pollution Control Act was adopted in 1972. The Act created the NPDES system for permitting wastewater discharges. The first NPDES permits focused on control of traditionally regulated pollutants, with emphasis on BOD, TSS, pH, oil and grease, and some metals, by requiring the use of Best Practicable Control Technology (BPT). The Act included a deadline for all facilities to be compliance with BPT and also established a compliance deadline for installing Best Available Technology (BAT). Most permits issued to industrial facilities contained effluent limits based on Best Professional Judgment (BPJ). In 1977, the Clean Water Act was adopted, which shifted emphasis from controlling conventional pollutants to controlling toxic discharges and extended the compliance deadline for BAT. The conventional pollutants (BOD, TSS, pH, fecal coliform organisms, and oil and grease) controlled by BPT in the first round of permits were now subject to a new level of control termed Best Conventional Pollutant Control Technology (BCT).

For Oil and Grease, U.S. EPA has developed National Ambient Water Quality Criteria for the Protection of Human Health for the consumption of water and fish that requires that surface water be "Virtually free from oil and grease, particularly from the tastes and odors that emanate from petroleum products." U.S. EPA has also developed National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life that states that Oil and Grease should be limited to "0.01 of the lowest continuous flow 96-hour LC50 to several important freshwater and marine species, each having a demonstrated high susceptibility to oils and petrochemicals; surface waters shall be virtually free from floating nonpetroleum oils of vegetable or animal origin, as well as petroleum derived oils."

When developing effluent limits for an NPDES permit, pollutants controlled by the BAT and BCT requirements generally have Technology-Based Effluent Limits. For Oil and Grease, there are no numerical water quality standards on which to base Water Quality-Based Effluent Limits (except for Taste and Odor criteria for Total Petroleum Hydrocarbons). The Clean Water Act required secondary treatment standards for POTWs. The secondary treatment standards are the basis for Technology-Based Effluent Limits for POTWs. However, of the conventional pollutants, only BOD, TSS, and pH are included in the secondary treatment standards; Oil and Grease is not included.

Technology-Based Effluent Limitations
Observation and experience by treatment plant operators and regulators have found that oily waste having an average oil content less than 15 mg/l does not interfere extensively with operation and maintenance of WWTPs. Based on BPJ, existing Order No. 97-113 contains concentration- based Effluent Limitations for Oil and Grease of 10 mg/l as a Monthly Average and 15 mg/l as a Daily Maximum. The proposed Order contains the same concentration-based Effluent Limitations.

Concentration-based Effluent Limitations for Oil and Grease:
⇒ 10 mg/l as a Monthly Average
⇒ 15 mg/l as a Daily Maximum

New mass-based Effluent Limitations for Oil and Grease are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Oil and Grease mass limits are calculated using the concentration-based Effluent Limitations of 10 and 15 mg/l and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitations for Oil and Grease:
⇒ 10 mg/l x 8.345 x 2.18 MGD ≅ 182 lbs/day as a Monthly Average
⇒ 15 mg/l x 8.345 x 2.18 MGD ≅ 273 lbs/day as a Daily Maximum

Water Quality-Based Effluent Limitations/Taste and Odor
The California State Water Resources Control Board has established a Taste and Odor Threshold for Total Petroleum Hydrocarbons as Gasoline (TPHg) of 5 µg/l. U.S. EPA has established Suggested-No-

Adverse-Response Levels for Taste and Odor for Total Petroleum Hydrocarbons as both Diesel Oil and as Kerosene (TPHd and TPHk) of 100 µg/l.

Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) are components of gasoline and MTBE is a gasoline additive. U.S. EPA has established Taste and Odor Thresholds for Ethylbenzene at 29 µg/l, MTBE at 20 µg/l, Toluene at 42 µg/l, and Xylenes at 17 µg/l. The Journal of Applied Toxicology published a Taste and Odor Threshold for Benzene of 170 µg/l. Monitoring data submitted by the Discharger contained results for BTEX and MTBE. The Discharger has not submitted monitoring data for TPHg, TPHd, or TPHk. Benzene, Ethylbenzene, and Xylenes were not detected. Toluene was detected at 0.98 µg/l, which is lower than both the PMCL of 150 µg/l and the Taste and Odor Threshold of 42 µg/l for Toluene. No Effluent Limitations are proposed for the BTEX constituents because Benzene, Ethylbenzene, and Xylenes were not detected and Toluene was detected at concentrations below the criteria. MTBE was detected at up to 3.8 µg/l. Through Reasonable Potential Analysis (see MTBE below), it was shown that there is a statistical possibility for MTBE concentrations to exceed the SMCL of 5 µg/l. An Effluent Limitation is proposed for MTBE based on the SMCL of 5 µg/l, which is also protective of the Taste and Odor Threshold of 20 µg/l for MTBE.

The BTEX constituents comprise only a portion of TPHg. Without analytical data for TPHg, TPHd, and TPHk, it is not possible to determine whether the effluent exceeds the Taste and Odor Thresholds and whether Effluent Limitations are necessary. Therefore, a Provision is included that requires monitoring for the presence of TPH. A reopener is included if monitoring shows that Effluent Limitations are necessary.

Basin Plan Water Quality Objective for pH
Section III of the Basin Plan contains a numeric Water Quality Objective for pH. Numeric Water Quality Objectives are commonly applied to the receiving water as Receiving Water Limitations. However, in this case, the flow of the receiving water has been characterized as a low flow/intermittent. Therefore, end-of-pipe Effluent Limitations have been included in the proposed Order for pH, as well as Receiving Water Limitations to be protective of the Water Quality Objectives.

On page III-5.00, the Basin Plan Water Quality Objective for pH states, "*The pH shall not be depressed below 6.5 or raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*." Cold-water habitat is a beneficial use of Rock and Dry Creek. To protect the cold-water habitat beneficial use, the proposed Order contains an Effluent Limitation based on the Basin Plan Water Quality Objective for pH.

Basin Plan Pesticide Water Quality Objective - Persistent Chlorinated Hydrocarbon Pesticides (2,4-D, DDE, Dalapon, Dinoseb, Endosulfan, Heptachlor Epoxide, and 2,4,5-TP)
Section III of the Basin Plan contains Water Quality Objectives for the Central Valley Region. The Pesticide Water Quality Objectives, on page III.6.00 of the Basin Plan, states "*Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency*

[U.S. EPA] *or the Executive Officer*." The Pesticide Water Quality Objective further states "*For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses*."

The Basin Plan does **not** contain a list of the pesticides, including herbicides and breakdown products of pesticides and herbicides, that are persistent, chlorinated hydrocarbons. The Basin Plan does not contain a definition of persistent or an explanation of the number of chlorine atoms that are required to define a chlorinated hydrocarbon. It should also be noted that PCBs are persistent in the environment and are chlorinated hydrocarbons, however, they are not pesticides. PCB's are addressed elsewhere in the proposed Order.

For the purposes of the proposed Order, a persistent pesticide will be defined as a pesticide, and its breakdown products, that are stable within the environment and/or bioaccumulative. Further, a pesticide that is stable within the environment is not easily transformed by processes such as photolysis, oxidation, hydrolysis, volatilization, sorption, biotransformation, and/or biodegradation. Additionally, a pesticide that is bioaccumulative, means that the pesticide bioconcentrates, or concentrates within living tissues and organisms. The rates of bioaccumulation and persistence are relative and not defined in the proposed Order.

Several sources have been reviewed to determine which chemicals qualify as "*persistent, chlorinated hydrocarbon pesticides*":

A. The Code of California Regulations (CCR), Title 22, Section 66261.24, Table III, contains a "List of Organic Persistent and Bioaccumulative Toxic Substances". The chlorinated hydrocarbon pesticides from Table III are listed below:

SUBSTANCE

Aldrin	Kepone
Chlordane	Lindane (Gamma BHC)
DDT, DDE, DDD	Methoxychlor
2,4-Dichlorophenoxyacetic acid (2,4-D)	Mirex
Dieldrin	Pentachlorophenol
Endrin	Toxaphene
Heptachlor	2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP or Silvex)

This list does not contain known breakdown products of the listed substances such as Endrin Aldehyde.

B. The U.S. EPA's list of Priority Pollutants also includes chlorinated hydrocarbon pesticides, including some of which are breakdown products:

PRIORITY POLLUTANT

Pentachlorophenol
Aldrin
Dieldrin
Chlordane
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha Endosulfan
Beta Endosulfan
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Heptachlor
Heptachlor Epoxide
(Hexachorocyclohexane - BHC)
  Alpha BHC
  Beta BHC
  Gamma BHC (Lindane)
  Delta BHC
Toxaphene

In a U.S. EPA document titled "*Water-Related Environmental Fate of 129 Priority Pollutants*", Volumes I and II, December 1979, the U.S. EPA compiled the results of studies done on the Priority Pollutants regarding the transforming parameters; chemical speciation, photolysis, oxidation, hydrolysis, volatilization, sorption, bioaccumulation, biotransformation, and biodegradation. For several of the constituents it is possible to estimate the relative persistence in the environment and bioaccumulation tendency. However, some of the studies had contradictory results and/or were inconclusive. In addition for some of the constituents, the various parameters had not been studied.

A U.S. EPA document titled "*National Recommended Water Quality Criteria: 2002, Human Health Criteria Calculation Matrix*", includes Bioconcentration Factors (BCFs) for the Priority Pollutants listed above, ranging between 11 for Pentachlorophenol to 53,600 for DDT.

C. Early editions of the Basin Plan referenced "Group A Pesticides", which is a reference to "*Water Quality Criteria*" also known as "The Green Book", a Report of the National Technical Advisory Committee to the Secretary of the Interior, April 1, 1968, and published by the Federal Water Pollution Control Administration (predecessor to the U.S. EPA). In The Green Book, Pesticide Group A contains the following list of chemicals that are "acutely toxic at concentrations of 5 µg/l and less":

Organochloride Pesticides

Aldrin
BHC
Chlordane
Endrin
Heptachlor
Lindane
DDT
Dieldrin
Endosulfan
Methoxychlor
Perthane
TDE (DDE)
Toxaphene

This list does not include breakdown products, nor does it refer to relative persistence. Also contained in The Green Book but not referenced in previous editions of the Basin Plan, is Pesticide Group B, which contains a list of pesticide compounds that are "generally not acutely toxic at levels of 1.0 mg/l or less". The Pesticide Group B list includes the following chlorinated hydrocarbon pesticides:

2,4-D compounds 2,4,5-T compounds

Again, persistence is not referenced.

D. The analytical methods used by laboratories to test for pesticides generally apply to groups of chemicals with similarities in chemical structure. A list of Organochlorine Pesticides that could be detected by one method (U.S. EPA Method 8080) includes the following chlorinated hydrocarbon pesticides (it also includes PCBs):

Organochlorine Pesticides

Aldrin	Endosulfan II (beta)
BHCs	Endosulfan Sulfate
Chlordane	Endrin
DDD	Endrin Aldehyde
DDE	Heptachlor
DDT	Heptachlor Epoxide
Dieldrin	Lindane
Endosulfan I (alpha)	Methoxychlor
	Toxaphene

A test for Organohalide Pesticides (U.S. EPA Method 617) includes additional chlorinated hydrocarbon pesticides (and PCBs) as well as pesticides that may contain other halogens (fluorine, bromine, iodine) instead of chlorine. The chlorinated hydrocarbon pesticides on the list include the following:

Organohalide Pesticides

Aldrin	Endrin Aldehyde
BHCs	Heptachlor
Captan	Heptachlor Epoxide
Chlordane	Isodrin (an isomer of Aldrin)
Dichloran	Lindane
Dicofol	Methoxychlor
Dieldrin	Mirex
Endosulfan I	PCNB
Endosulfan II	Perthane
Endosulfan Sulfate	Strobane
Endrin	Toxaphene

Another laboratory analytical method (U.S. EPA Method 8150) tests for Chlorinated Herbicides:

Chlorinated Herbicides

2,4-D	Dicamba
2,4-DB	Dichloroprop
2,4,5-T	Dinoseb
2,4,5,TP (Silvex)	MCPA
Dalapon	MCPP

There are many other chlorinated hydrocarbon pesticides that are not included in any of these lists and a comprehensive list is beyond the scope of the proposed Order. The rates of persistence and bioaccumulation are relative and the research into these parameters is incomplete. For the purposes of the proposed Order the list of persistent chlorinated hydrocarbon pesticides will include but not be limited to the following:

Persistent Chlorinated Hydrocarbon Pesticides

Aldrin	Endosulfan I (Alpha)
Alpha BHC	Endosulfan II (Beta)
Beta BHC	Endosulfan Sulfate
Gamma BHC (Lindane)	Endrin
Delta BHC	Endrin Aldehyde
Captan	Heptachlor
Chlordane	Heptachlor Epoxide
2,4-D	Isodrin (an isomer of Aldrin)
2,4-DB	Kepone (Chlordecone)
2,4-D compounds	MCPA
DDD (TDE)	MCPP
DDE	Methoxychlor
DDT	Mirex
Dalapon	PCNB
Dicamba	Pentachlorophenol
Dichloran	Perthane
Dichloroprop	Strobane
Dicofol	2,4,5-T
Dieldrin	2,4,5,TP (Silvex)
Dinoseb	2,4,5-T compounds
	Toxaphene

Reasonable Potential Analysis

As stated above, the Basin Plan Pesticide Water Quality Objective states "*Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency* [U.S. EPA] *or the Executive Officer*."

The effluent monitoring results submitted by the Discharger (see Table 4), reported the detection of several chlorinated hydrocarbon pesticides; 2,4-D, DDE, Dalapon, Dinoseb, Endosulfan I and Endosulfan II, Heptachlor Epoxide, and 2,4,5-TP. 2,4-D was reported by the laboratory to be in two of six samples at estimated concentrations of 0.45 and 0.69 µg/l. DDE was detected in one of five samples

at a concentration of 0.058 µg/l, which also exceeded the CTR Criteria for the protection of Human Health of 0.00059 µg/l. Dalapon was reported by the laboratory to be in two of six samples; one at a concentration of 13 µg/l and the other at an estimated concentration of 1.1 µg/l. Endosulfan I and Endosulfan II were detected in one of five samples at concentrations of 0.10 and 1.2 µg/l, respectively. The concentrations of Endosulfan also exceeded the CTR Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life of 0.056 µg/l as a 4-Day Average and 0.22 µg/l as an Instantaneous Maximum. Heptachlor Epoxide was detected in one of five samples at a concentration of 0.086 µg/l, which also exceeds the CTR Human Health Criterion of 0.0001 µg/l. 2,4,5-TP was reported by the laboratory to be in two of six samples at estimated concentrations of 0.077 and 0.62 µg/l.

Effluent Limitations
The presence of these pesticides in the effluent presents a reasonable potential to exceed the Basin Plan Water Quality Objective for Pesticides. To protect the aquatic beneficial uses of the receiving water, a concentration-based Effluent Limitation for Persistent Chlorinated Hydrocarbon Pesticides, based on the Basin Water Quality Objective for Pesticides, is included in the proposed Order:

Concentration-based Effluent Limitation for Persistent Chlorinated Hydrocarbon Pesticides:
⇒ Not detectable within the accuracy of analytical methods approved by the U.S. EPA or the Executive Officer

Mass-based Effluent Limitations for Persistent Chlorinated Hydrocarbon Pesticides are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f):

Mass-based Effluent Limitations for Persistent Chlorinated Hydrocarbon Pesticides:
⇒ 0.0000 lbs/day as a Monthly Average
⇒ 0.0000 lbs/day as a Daily Maximum

These limitations are protective of the U.S. EPA CTR Criteria for the Protection of Health for DDE and Heptachlor Epoxide and the CTR Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for Endosulfan.

Basin Plan Water Quality Objective for Settleable Solids
Analytically, Total Solids content of wastewater is defined as all matter that remains as a residue upon evaporation at 103 to 105 °C. Settleable Solids are those that will settle to the bottom of a cone-shaped container (called an Imhoff Cone) in a 60-minute period. Settleable Solids, expressed as ml/l, are an approximate measure of the quality of sludge that will be removed in the primary sedimentation process. Total Solids can be further classified as nonfilterable (suspended) or filterable (colloidal and dissolved). Typical composition of untreated domestic wastewater includes concentrations of Settleable Solids, ranging from weak at 5ml/l to strong at 15 ml/l. After treatment Settleable Solids concentrations should be significantly reduced. Measurement of Settleable Solids is constrained by the capability of the Imhoff Cone itself, which cannot measure concentrations below 0.1 ml/l. Consequently, the proposed

Order contains Effluent Limitations for Settleable Solids at 0.1 ml/l as a 30-Day Average and 0.2 ml/l as a Daily Maximum.

Basin Plan Toxicity Water Quality Objective - Survival of Aquatic Organisms
On page III-8.00, the Basin Plan narrative Toxicity Water Quality Objective prohibits the discharge of toxic substances in toxic amounts. "*This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration… The survival of aquatic life in surface waters subjected to a waste discharge… shall not be less than that for the same water body in areas unaffected by the waste discharge… As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay… In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate…*"

The proposed Order contains an Effluent Limitation that requires that the survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than 70% for any one bioassay and 90% for the median of three or more consecutive bioassays. The proposed Order and Monitoring and Reporting Program also prescribe chronic toxicity monitoring and reporting protocols.

Basin Plan Toxicity Water Quality Objective - Aluminum, Ammonia, Atrazine, Chlorine Residual, PAEs, and Tributyltin
On page III-8.00, the Basin Plan narrative Toxicity Water Quality Objective prohibits the discharge of toxic substances in toxic amounts. On page IV-17.00, the Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. Effluent Limitations for Aluminum, Ammonia, Atrazine, Chlorine Residual, PAEs, and Tributyltin based on the Basin Plan narrative Toxicity Objective are described as follows:

Aluminum
Aluminum can be toxic to aquatic organisms. Based on information submitted by the Discharger, Polyaluminum Hydroxychloride may be used as a coagulant before the wastewater flows to the gravity filters. The use of this coagulant presents a reasonable potential for the discharge of elevated concentrations of Aluminum to cause or contribute to an in-stream excursion above the Basin Plan prohibition against the discharge of toxic constituents in toxic concentrations.

For Aluminum, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended Acute or Maximum Concentration (1-Hour Average) for Aluminum is 750 µg/l (micrograms per liter = 10^{-3} g/l) and the Chronic or Continuous Concentration (4-Day Average) is 87 µg/l, (both expressed as total recoverable Aluminum). U.S. EPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria.

Effluent monitoring results submitted by the Discharger (see Table 1) indicated the presence of total recoverable Aluminum, in twelve samples, at concentrations of 11.8, 12.8, 25.1, 27.2, 27.4, 28.7, 37.7, 59.0, 61.0, 256, 274, and 404 µg/l. The three highest concentrations were above the Chronic Criteria. New Effluent Limitations for Aluminum have been included in the proposed Order to protect the receiving stream aquatic life beneficial uses based on U.S. EPA's recommended aquatic criteria, and have been established at the Ambient Water Quality Criteria for Aluminum.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$AMEL = 2.22\left[\min(0.163CMC, 0.302CCC)\right] \quad MDEL = 6.13\left[\min\left(0.163CMC, 0.302CCC\right)\right]$$

where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Concentration-based Effluent Limitations for Aluminum:
⇒ 160 µg/l = 0.160 mg/l as a Daily Average
⇒ 87 µg/l = 0.087 mg/l as a 4-Day Average
⇒ 58 µg/l = 0.058 mg/l as a Monthly Average

Mass-based Effluent Limitations for Aluminum are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Aluminum mass limits are calculated using the concentration-based Effluent Limitations and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitations for Aluminum:
⇒ 0.160 mg/l x 8.345 x 2.18 MGD ≅ 2.9 lbs/day as a Daily Average
⇒ 0.087 mg/l x 8.345 x 2.18 MGD ≅ 1.58 lbs/day as a 4-Day Average
⇒ 0.058 mg/l x 8.345 x 2.18 MGD ≅ 1.1 lbs/day as a Monthly Average

Ammonia
Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts Ammonia to Nitrate, and denitrification is a process that converts Nitrate to Nitrogen Gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove Ammonia from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of Ammonia or Nitrate to the receiving stream.

In water, un-ionized Ammonia (NH_3) exists in equilibrium with the Ammonium ion (NH_4^+). The toxicity of aqueous Ammonia solutions to aquatic organisms is primarily attributable to the un-ionized Ammonia form, with the Ammonium ion being relatively less toxic. Total Ammonia refers to the sum of these two forms in aqueous solutions. Analytical methods are used to directly determine the Total Ammonia concentration, which is then used to calculate the un-ionized Ammonia (toxic) concentration in water.

U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, for Total Ammonia, include acute (1-Hour Average) standards based on pH and chronic (30-Day Average) standards based on pH and temperature. In addition, U.S. EPA specified that the highest 4-Day Average within a 30-Day period shall not exceed 2.5 times the chronic criteria. U.S. EPA found that as pH increased, both the acute and chronic toxicity of Ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of Ammonia is not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. U.S. EPA has presented the Acute Ammonia Criteria in three ways: as equations, in a table, and in graphs that relate pH to Ammonia concentrations. Attachment C shows the Acute Criteria when salmonids are present. The Chronic Criteria have been presented in tables shown in Attachments D and E. The equations used to calculate the Ammonia criteria are shown below and in Attachments C, D, and E:

Criteria Maximum Concentration (1-Hour Ave.) = CMC =

$$\left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right)$$

Criteria Continuous Concentration (30-Day Ave.) = CCC

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times MIN\left(2.85, 1.45 \times 10^{0.028 \times (25 - T)}\right)$$

2.5 x Criteria Continuous Concentration = 2.5 x CCC

$$2.5 \times CCC = 2.5 \times \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times MIN\left(2.85, 1.45 \times 10^{0.028 \times (25 - T)}\right)$$

The existing Order contains a Receiving Water Limitation for un-ionized Ammonia, that requires that the discharge shall not cause Ammonia in the receiving water to exceed 0.025 mg/l as Nitrogen. The WWTP has had numerous violations of the Receiving Water Limitation. Effluent monitoring results submitted by the Discharger indicate that the concentration of Ammonia in the effluent has exceeded the U.S. EPA Ambient Water Quality Chronic Criteria for Ammonia on numerous occasions.

Concentration-Based Effluent Limitations for Ammonia

The Code of Federal Regulations, 40 CFR 122.44(d)(1)(iii), states that when a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above allowable numeric criteria for an individual pollutant, the NPDES permit must contain an effluent limit. Therefore, the proposed Order contains new Effluent Limitations for Ammonia based on the Ambient Water Quality Criteria represented in Attachments C, D, and E. The Discharger must calculate and report the 1-Hour Average

using Attachment C, the 4-Day Average using Attachment D, and 30-Day Average using Attachment E. The equations to complete the calculations are shown above.

Mass-Based Effluent Limitations for Ammonia
Mass-based Effluent Limitations for Ammonia are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated according to Attachments C, D and E, and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day). The calculations will be similar to those shown above, for Aluminum.

Atrazine
For Atrazine, a triazine pesticide (not a chlorinated hydrocarbon), the U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended Instantaneous Maximum Concentration is 1.0 µg/l (0.001 mg/l). Monitoring results submitted by the Discharger (see Table 4) indicated the presence of Atrazine in one of five samples, at a concentration of 2.0 µg/l, which is above the Criteria to protect freshwater aquatic life. The Basin Plan prohibits the discharge of toxic substances in toxic amounts. To protect the receiving stream aquatic life beneficial uses, a new concentration-based Effluent Limitation for Atrazine, based on the Ambient Water Quality Criterion, is included in the proposed Order:

Concentration-based Effluent Limitation for Atrazine:
⇒ 1.0 µg/l as an Instantaneous Maximum

A mass-based Effluent Limitation for Atrazine is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Atrazine mass limit is calculated using the concentration-based Effluent Limitation of 1.0 µg/l (0.001 mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Atrazine:
⇒ 0.001 mg/l x 8.345 x 2.18 MGD ≅ 0.0182 lbs/day as a Daily Maximum

Chlorine Residual
Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The Discharger uses Chlorine for disinfection at the WWTP. For dechlorination, the Discharger uses sulfur dioxide, which combines with Chlorine, to render it relatively unreactive and thus remove it from the waste stream. Inadequate dechlorination may result in discharge of Chlorine to the receiving stream and cause toxicity. The Basin Plan prohibits the discharge of toxic substances in toxic amounts. The use of Chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations.

Chlorine can cause toxicity to aquatic organisms when discharged to surface waters. For Chlorine, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The Recommended Maximum Concentration (1-Hour Average) for Chlorine is 0.019 mg/l and the Chronic

(4-Day Average) is 0.011 mg/l. Rounded off, the limits are 0.02 mg/l and 0.01 mg/l, respectively. Concentration-based Effluent Limitations for Chlorine Residual, based on these criteria, are included in the Order.

The previous Order contained only an Effluent Limitation for Chlorine Residual of 0.02 mg/l as a Daily Maximum. To be protective of aquatic life beneficial uses, the Effluent Limitations must correspond to the Ambient Water Quality Criteria. Concentration-based Effluent Limitations for Chlorine Residual have been included in the proposed Order to protect the receiving stream aquatic life beneficial uses and have been established at the Ambient Water Quality Criteria for Chlorine. The proposed Order contains the same Daily Maximum Limitation as the existing Order, 0.02 mg/l expressed as a 1-Hour Average, but also contains a new Effluent Limitation of 0.01 mg/l as a 4-Day Average:

Concentration-based Effluent Limitations for Chlorine Residual:
⇒ 0.02 mg/l as a 1-Hour Average (existing)
⇒ 0.01 mg/l as a 4-Day Average (new)

The existing treatment and disinfection system is capable of achieving 0.01 mg/l Chlorine Residual as a 4-Day Average and 0.02 mg/l Chlorine Residual as a 1-Hour Average. Therefore, a compliance schedule has not been included.

Mass-based Effluent Limitations are also included in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Chlorine Residual mass limits are calculated using the concentration-based Effluent Limitations (Acute and Chronic Ambient Water Quality Criteria, 0.02 mg/l and 0.01 mg/l, respectively) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitations for Chlorine Residual:
⇒ 0.02 mg/l x 8.345 x 2.18 MGD ≅ 0.364 lbs/day as a 1-Hour Average
⇒ 0.01 mg/l x 8.345 x 2.18 MGD ≅ 0.182 lbs/day as a 4-Day Average

PAEs
Phthalate acid esters (PAEs) represent a large family of chemicals widely used as plasticizers, primarily in the production of polyvinyl chloride (PVC) resins. PVC resins are used in such diverse industries as construction, home furnishings, transportation, apparel, and food and medical packaging materials. Phthalates also have non-plasticizer uses in pesticide carriers, cosmetics, fragrances, munitions, industrial oils, and insect repellants. The most widely used phthalate plasticizer is Bis(2-ethylhexyl)phthalate. Other PAEs include Dioctyl phthalates, Butyl benzyl phthalate (BBP), Diisodecyl phthalate, Dibutyl phthalate (DBP), Diethyl phthalate (DEP), Dimethyl phthalate (DMP), Di-tridecyl phthalate, and n-Hexyl n-decyl phthalate.

In the Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, U.S. EPA has published Toxicity Information on the Chronic Lowest Observed Effect Level for the sum of the PAEs of 3 µg/l. For Bis(2-ethylhexyl)phthalate, individually, the U.S. EPA CTR Criterion to protect Human

Health (30-Day average) for Drinking Water Sources (consumption of water and aquatic organisms) is 1.8 µg/l.

In the monitoring results submitted by the Discharger (see Table 3), the laboratory reported the presence of Bis(2-ethylhexyl)phthalate in two of five samples, at estimated concentrations of 1.7 and 2.93 µg/l, Diethyl phthalate in one of five samples, at a concentration of 4.57 µg/l, and Di-n-butyl phthalate in one of five samples, at an estimated concentration of 1.0 µg/l. The Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l and the Diethyl phthalate concentration of 4.57 µg/l were detected in the same sample. The sum of the two PAEs exceeds the Chronic Lowest Observed Effect Level for PAEs of 3 µg/l. The estimated Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l also exceeds the CTR Criterion of 1.8 µg/l. Individual Effluent Limitations for Bis(2-ethylhexyl)phthalate are discussed below.

To protect the aquatic habitat beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for the sum of the PAEs, based on the Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, U.S. EPA Toxicity Information on the Chronic Lowest Observed Effect Level for PAEs of 3 µg/l (as a 30-Day Average), is included in the proposed Order:

Concentration-based Effluent Limitation, for Sum of PAEs:
⇒ 3 µg/l as a Monthly Average

A mass-based Effluent Limitation for the sum of the PAEs is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The mass limit for the sum of the PAEs is calculated using the concentration-based Effluent Limitation of 3 µg/l (0.003 mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Sum of PAEs:
⇒ 0.003 mg/l x 8.345 x 2.18 MGD ≅ 0.055 lbs/day as a Monthly Average

Tributyltin:
Tributyltin (TBT) is an organometallic compound in which a carbon atom is linked to a tin atom. Tributyltin is primarily used as a biocide in antifouling paints applied to ship hulls to keep barnacles and other organisms from attaching to the hull. TBT remains effective over long periods because it is released slowly into the water column over time.

For Tributyltin, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The Recommended Maximum Concentration (1-Hour Average) for Tributyltin is 0.46 µg/l and the Chronic (4-Day Average) is 0.072 µg/l.

Monitoring results submitted by the Discharger (see Table 6) indicated the presence of Tributyltin in three of twelve samples, at concentrations of 0.006, 0.008, and 0.066 µg/l. The maximum projected effluent concentration of Tributyltin exceeded the Chronic Criteria (0.072 µg/l). To protect the aquatic

beneficial uses of the receiving water, concentration-based Effluent Limitations for Tributyltin, based on the Ambient Water Quality Criteria, are included in the proposed Order.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$AMEL = 2.87\left[\min(0.112CMC, 0.193CCC)\right] \quad MDEL = 8.91\left[\min\left(0.112CMC, 0.193CCC\right)\right]$$

where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Concentration-based Effluent Limitations for Tributyltin:
⇒ 0.12 µg/l as a Daily Average
⇒ 0.063 µg/l as a 4-Day Average
⇒ 0.040 µg/l as a Monthly Average

Mass-based Effluent Limitation for Tributyltin are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The mass limits are calculated using the concentration-based Effluent Limitations of 0.11 µg/l (0.00011 mg/l), 0.063 µg/l (0.000063 mg/l), and 0.035 µg/l (0.000035 mg/l), and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitations for Tributyltin:
⇒ 0.00011 mg/l x 8.345 x 2.18 MGD ≅ 0.0020 lbs/day as a Daily Average
⇒ 0.000063 mg/l x 8.345 x 2.18 MGD ≅ 0.0011 lbs/day as a 4-Day Average
⇒ 0.000035 mg/l x 8.345 x 2.18 ≅ 0.00064 as a Monthly Average

Drinking Water Standards for Alachlor, Nitrate, and Nitrite, and Manganese and MTBE
Section III of the Basin Plan contains Water Quality Objectives. On page III-3.00, the Chemical Constituents states "*Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses…At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in…Title 22 of the California Code of Regulations*". DHS has adopted Primary MCLs in Title 22 for Alachlor, Nitrate, and Nitrite and Secondary MCLs for Manganese and MTBE. Municipal and domestic supply is a beneficial use of the receiving water. Effluent Limitations for Alachlor, Nitrate, and Nitrite based on the PMCLs, and for Manganese and MTBE based on the SMCLs, are described below:

Alachlor
For Alachlor, the U.S. EPA and subsequently DHS, have developed a PMCL of 2 µg/l. Monitoring results submitted by the Discharger (see Table 4) indicated the presence of Alachlor, an herbicide (not persistent), in one of five samples, at a concentration of 3.2 µg/l, which is above the PMCL. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for Alachlor, based on the PMCL, is included in the proposed Order:

Concentration-based Effluent Limitation for Alachlor:
⇒ 2 µg/l as a Monthly Average

A mass-based Effluent Limitation for Alachlor is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Alachlor mass limit is calculated using the concentration-based Effluent Limitation of 2 µg/l (0.002 mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Alachlor:
⇒ 0.002 mg/l x 8.345 x 2.18 MGD ≅ 0.0364 lbs/day as a Monthly Average

Nitrate
Untreated domestic wastewater contains Ammonia. Nitrification is a biological process that converts Ammonia to Nitrate, and denitrification is a process that converts Nitrate to Nitrogen Gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove Ammonia from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of Ammonia or Nitrate to the receiving stream. The Discharger's WWTP does not include denitrification as a unit process, increasing the probability that Nitrate may be discharged to the receiving stream.

The U.S. EPA and subsequently DHS, have developed a PMCL of 10,000 µg/l (10.0 mg/l) for total Nitrate plus Nitrite (as N). Recent toxicity studies have also indicated a possibility that Nitrate is toxic to aquatic organisms. The conversion of Ammonia to Nitrate presents a reasonable potential for the discharge to exceed the PMCL for Nitrate. Effluent monitoring results submitted by the Discharger (see Table 6) indicated the presence of Nitrate (as N), in twelve samples, at concentrations of 2.7, 6.3, 6.8, 7.0, 7.5, 7.8, 12, 13, 13, 13, 17, and 22 mg/l, and Nitrite (as N) in three of twelve samples at 0.22, 0.28, and 0.37 mg/l. The six highest reported concentrations of Nitrate alone exceeded the PMCL.

The proposed Order includes a new concentration-based Effluent Limitation for total Nitrate plus Nitrite (as N) based on the PMCL, which will be protective of the municipal beneficial use if the receiving stream:

Concentration-based Effluent Limitation for Total Nitrate plus Nitrite (as N):
⇒ 10 mg/l as a Monthly Average

A mass-based Effluent Limitation for Nitrate is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The total Nitrate plus Nitrite mass limit is calculated using the concentration-based Effluent Limitation of 10 mg/l and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Total Nitrate plus Nitrite (as N):
⇒ 10 mg/l x 8.345 x 2.18 MGD ≅ 182 lbs/day as a Monthly Average

Nitrite
For Nitrite, the U.S. EPA and subsequently the DHS, have developed a PMCL of 1,000 µg/l (1 mg/l). Effluent monitoring results submitted by the Discharger (see Table 6) indicated the presence of Nitrite, in three of twelve samples, at concentrations of 0.22, 0.28, and 0.37 mg/l.

While none of the concentrations exceeded the PMCL, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined below in the discussion for Chloride and the calculation procedures for C_v are shown in the discussions for Chloride and Copper.)

For Nitrite:

1. **n = 12** and **Highest Value = 0.37 mg/l**
2. **n = 12** ⇒ **C_V = 1.62**
3. **n = 12** and **C_V = 1.62** ⇒ **Multiplication Factor = 8.24** (Table 3-1 of the TSD)
4. **0.37 mg/l x 8.24 = 3.05 mg/l**
5. **3.05 mg/l > 1 mg/l** ⇒ Reasonable Potential exists to exceed the PMCL

The Reasonable Potential Analysis indicated that there is a statistical probability for Nitrite in the effluent to exceed the PMCL. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for Nitrite, based on the PMCL, is included in the proposed Order:

Concentration-based Effluent Limitation for Nitrite:
⇒ 1 mg/l as a Monthly Average

A mass-based Effluent Limitation for Nitrite is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Nitrite mass limit is calculated using the concentration-based Effluent Limitation (PMCL of 1 mg/l) and the mass-calculation equation explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Nitrite:
⇒ 1 mg/l x 8.345 x 2.18 MGD ≅ 18.2 lbs/day as a Monthly Average

Manganese
For Manganese, the U.S. EPA and the California DHS have developed an SMCL of 50 µg/l (0.050 mg/l). Effluent monitoring results submitted by the Discharger (see Table 1) indicated the presence of total recoverable Manganese, in twelve samples, at concentrations of 14.4, 21.1, 24.6, 26.2, 32.1, 32.9, 33.7, 35.3, 40.0, 43.6, 48.7, and 55.0 µg/l. The highest reported Manganese concentration exceeded the SMCL.
To protect the drinking water beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for Manganese, based on the SMCL, is included in the proposed Order:

Concentration-based Effluent Limitation for Manganese:
⇒ 50 µg/l as a Monthly Average

A mass-based Effluent Limitation for Manganese is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Manganese mass limit is calculated using the concentration-based Effluent Limitation (SMCL of 0.050 mg/l) and the mass-calculation equation explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Manganese:
⇒ 0.050 mg/l x 8.345 x 2.18 MGD ≅ 0.910 lbs/day as a Monthly Average

MTBE (Methyl tert Butyl Ether)
For MTBE, DHS has developed an SMCL of 5 µg/l (0.005 mg/l). Effluent monitoring results submitted by the Discharger (see Table 2) indicated the presence of MTBE (a gasoline additive), in seven of twelve samples, at concentrations of 0.21, 0.22, 0.40, 0.47, 0.81, 1.2, and 3.8 µg/l.

While none of the concentrations exceeded the SMCL, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined below in the discussion for Chloride and the calculation procedures for C_v are shown in the discussions for Chloride and Copper.)

For MTBE:

1. **n = 12** and **Highest Value = 3.8 µg/l**
2. **n = 12** ⇒ **C_V = 1.51**
3. **n = 12** and **C_V = 1.51** ⇒ **Multiplication Factor = 7.56** (Table 3-1 of the TSD)

4. **3.8 µg/l x 7.56 = 28.73 µg/l**

5. **28.73 µg/l > 5 µg/l** ⇒ Reasonable Potential exists to exceed the SMCL

The Reasonable Potential Analysis indicated that there is a statistical probability for MTBE in the effluent to exceed the SMCL. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for MTBE, based on the SMCL, is included in the proposed Order:

Concentration-based Effluent Limitation for MTBE:
⇒ 5 µg/l as a Monthly Average
A mass-based Effluent Limitation for MTBE is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The MTBE mass limit is calculated using the concentration-based Effluent Limitation (SMCL of 0.005 mg/l) and the mass-calculation equation explained and shown above in the introduction to Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for MTBE:
⇒ 0.005 mg/l x 8.345 x 2.18 MGD ≅ 0.091 lbs/day as a Monthly Average

CTR Criteria for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc

NTR AND CTR
The U.S. EPA adopted the NTR and the CTR that contain numerical water quality standards for many wastewater constituents. Additional explanation of the NTR and CTR is provided in Findings above. The SIP, adopted by the State Water Resources Control Board, contains guidance on implementation of the NTR and the CTR. These Rules contain water quality standards applicable to this discharge. Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc based on the NTR and CTR are described below.

DEVELOPMENT OF INTERIM LIMITATIONS
Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1 states further that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: "*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable."* The proposed Order requires the Discharger to provide this information. If justification for compliance schedules is **not** completed and submitted by

the Discharger to the Regional Board, or the Regional Board determines that the justification is not adequate, the new water quality based Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc become effective on **1 September 2004**. If compliance schedules are justified and implemented, then the final water quality based effluent limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc become effective **30 January 2009**. The proposed Order contains a Provision with a compliance schedule for implementation of effluent limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc.

If compliance schedules are granted for implementation of final Effluent Limitations for CTR and NTR constituents, Section 2.2.1 of the SIP requires the Regional Board to establish interim limitations and compliance dates in the NPDES permit. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with interim Effluent Limitations, can significantly degrade water quality and adversely impact the beneficial uses of the receiving stream on a long-term basis. For example, regarding Copper, U.S. EPA states, in the Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life, that an unstressed system will take approximately three years to recover from a pollutant in which exposure to Copper exceeds the recommended criterion. However, the interim Effluent Limitations establish enforceable ceiling concentrations until compliance with the final Effluent Limitations can be achieved.

The SIP requires that interim limitations must: 1) be based on current treatment plant performance or existing permit limitations, whichever is more stringent; 2) include interim compliance dates separated by no more than one year; and 3) be included in the Provisions. There are no limitations for CTR and NTR constituents in the existing Order. Therefore, the interim limitations in the proposed Order are based on the current treatment plant performance.

To develop interim Effluent Limitations:

- Procedures for deriving water quality-based limits are outlined in U.S. EPA's *Technical Support Document for Water Quality Based Toxics Control,* EPA/505/2-90-001 (TSD). Table 5-2 of the TSD contains multipliers to be used in establishing maximum daily limits based on a long-term average objective and the Coefficient of Variation (C_V) for the data set.

- When there are ten or more sampling data points, the variability in sampling and the laboratory is accounted for by establishing interim Effluent Limitations based on normally distributed data, where 99.9% of the data points lie within 3.3 standard deviations from the mean (*Basic Statistical Methods for Engineers and Scientists*, Kennedy and Neville, Harper and Row). In this case, once the C_V is calculated, the appropriate multiplier can be selected from Table 5.2. Where actual sampling shows an

exceedance of the proposed 3.3 standard deviation based interim Effluent Limitation, the maximum detected concentration is established as the interim Effluent Limitation.

- The TSD acknowledges that a minimum of ten data points is necessary to conduct a statistical analysis based on normally distributed data. When less than ten data points are available, the TSD recommends use of a C_V of 0.6 to represent wastewater effluent sampling. In this case, the long-term average objective is to maintain, at a minimum, the current performance level of the treatment plant. With $C_V = 0.6$ and with a 99^{th} Percentile occurrence probability, Table 5.2 provides a multiplier of 3.11.

- The interim Effluent Limitation is established by multiplying the maximum concentration of the observed sample points by the appropriate multiplier.

The Discharger can undertake source control and treatment plant operational measures to maintain compliance with the interim limitations included in the proposed Order. The proposed Order contains a Provision with interim compliance dates, and interim Effluent Limitations based on the current treatment plant performance, for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc.

Bis(2-ethylhexyl)phthalate (also known as Di(2-ethylhexyl)phthalate)
For Bis(2-ethylhexyl)phthalate, the CTR Criterion to protect Human Health (30-Day average) for Drinking Water Sources (consumption of water and aquatic organisms) is 1.8 µg/l. Effluent monitoring results submitted by the Discharger (see Table 3) indicated detectable concentrations of Bis(2-ethylhexyl)phthalate, in two of five samples. The concentrations were estimated by the analyzing laboratory to be 1.7 and 2.93 µg/l. The highest estimated concentration of Bis(2-ethylhexyl)phthalate in the effluent exceeded the CTR criterion. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Bis(2-ethylhexyl)phthalate, based on the CTR Criterion, is included in the proposed Order:

Final Concentration-based Effluent Limitation for Bis(2-ethylhexyl)phthalate:
⇒ 1.8 µg/l as a Monthly Average

Mass-based final Effluent Limitations for Bis(2-ethylhexyl)phthalate are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Bis(2-ethylhexyl)phthalate mass limit is calculated using the concentration-based Effluent Limitation of 1.8 µg/l (0.0018 mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitation for Bis(2-ethylhexyl)phthalate:
⇒ 0.0018 mg/l x 8.345 x 2.18 MGD ≅ 0.0327 lbs/day as a Monthly Average

If a compliance schedule is granted for implementation of the final Effluent Limitations for Bis(2-ethylhexyl)phthalate, then an interim Daily Maximum Effluent Limitation for

Bis(2-ethylhexyl)phthalate is calculated using the procedure outlined above in the introduction for this Section:

n = 5 and **Highest Value = 2.93 µg/l**

n < 10 ⇒ **C_V = 0.6**

C_V = 0.6 ⇒ **Multiplication Factor = 3.11** (Table 5-2 of the TSD)

Interim Effluent Limitation for Bis(2-ethylhexyl)phthalate:
⇒ 2.93 µg/l x 3.11 = 9.11 µg/l, as a Daily Maximum

Calculation procedures for C_V are shown in the discussions for Chloride and Copper.

Bromodichloromethane
The CTR Criterion for Bromodichloromethane to protect Human Health (30-Day average) for Drinking Water Sources (consumption of water and aquatic organisms) is 0.56 µg/l. Effluent monitoring results submitted by the Discharger (see Table 2), contained concentrations of Bromodichloromethane, in ten of twelve samples, at 0.50, 0.60, 0.61, 0.63, 0.64, 0.66, 0.69, 0.71, 1.2, and 1.5 µg/l. Nine of the reported concentrations exceed the CTR criterion for Bromodichloromethane. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Bromodichloromethane, based on the CTR Criterion, is included in the proposed Order:

Final Concentration-based Effluent Limitation for Bromodichloromethane:
⇒ 0.56 µg/l as a Monthly Average

Bromodichloromethane, Bromoform, Chloroform, and Dibromochloromethane are collectively known as Total Trihalomethanes. U.S. EPA has established a PMCL for Total Trihalomethanes of 80 µg/l. Bromodichloromethane, Chloroform, and Dibromochloromethane were detected in the effluent from SMD1. Bromoform was not detected. The sums of the concentrations of Bromodichloromethane, Chloroform, and Dibromochloromethane do not exceed the PMCL and had no reasonable potential to do so. The Effluent Limitations for Chloroform and Bromodichloromethane are protective of the drinking water beneficial uses and below the PMCL. Chloroform was detected at concentrations that exceeded OEHHA Criteria and is discussed below. The concentration of Dibromochloromethane did not exceed the water quality criteria, therefore, effluent limitations for Dibromochloromethane are not proposed.

A mass-based Effluent Limitation for Bromodichloromethane (final Effluent Limitation) is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Bromodichloromethane mass limit is calculated using the concentration-based Effluent Limitation of 0.56 µg/l (0.00056 mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitation for Bromodichloromethane:

$\Rightarrow$ 0.00056 mg/l x 8.345 x 2.18 MGD $\cong$ 0.0102 lbs/day as a Monthly Average

If a compliance schedule is granted for implementation of the final Effluent Limitations for Bromodichloromethane, then an interim Daily Maximum Effluent Limitation for Bromodichloromethane is calculated using the procedure outlined above in the introduction to this Section:

n = 12 and **Highest Value = 1.5 µg/l**

n = 12 $\Rightarrow$ **C_V = 0.72**

C_V = 0.72 $\Rightarrow$ **Multiplication Factor = 3.65** (Table 5-2 of the TSD)

Interim Effluent Limitation for Bromodichloromethane:
$\Rightarrow$ 1.5 µg/l x 3.65 = 5.48 µg/l, as a Daily Maximum

Calculation procedures for C_V are shown in the discussions for Chloride and Copper.

Copper
The toxicity of Copper to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Copper to aquatic life increases. The CTR Copper Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Copper Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for both the Acute and Chronic Copper Criteria is: CF = 0.96. The equations to calculate the Copper Criteria (expressed as the dissolved fraction and including the conversion factor) are:

Criteria Continuous Concentration (4-Day Ave.) = CCC = $\left(e^{\{0.8545[ln(\text{hardness})] - 1.702\}}\right)x\left(0.960\right)$

Criteria Maximum Concentration (1-Hour Ave.) = CMC = $\left(e^{\{0.9422[ln(\text{hardness})] - 1.700\}}\right)x\left(0.960\right)$

The equations to calculate the Copper Criteria (expressed as total recoverable fraction) are:

Criteria Continuous Concentration (4-Day Ave.) = CCC = $\left(e^{\{0.8545[ln(\text{hardness})] - 1.702\}}\right)$

Criteria Maximum Concentration (1-Hour Ave.) = CMC = $\left(e^{\{0.9422[ln(\text{hardness})] - 1.700\}}\right)$

Effluent monitoring data submitted by the Discharger (see Table 1) contained concentrations of dissolved Copper in twelve samples, at 0.82, 0.88, 1.08, 1.18, 1.48, 1.49, 1.87, 1.90, 1.96, 2.11, 2.47,

and 2.57 µg/l, and concentrations of total recoverable Copper, in twelve samples, at 0.88, 0.92, 1.07, 1.49, 1.52, 1.52, 1.78, 1.97, 2.05, 2.22, 2.68, and 2.93 µg/l.

Reasonable Potential Analysis for copper
The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Copper fraction) are calculated to be 5.9 µg/l and 8.4 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Copper fraction) are calculated to be 6.1 µg/l and 8.8 µg/l. None of the Copper concentrations exceeded the Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Copper concentrations in the effluent alone do not create toxic conditions.

However, the Discharger also submitted hardness data, for Rock Creek upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Copper fraction) are calculated to be 2.3 µg/l and 2.9 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Copper fraction) are calculated to be 2.4 µg/l and 3.1 µg/l. With a receiving water hardness of 20 mg/l, the two highest reported concentrations of Copper (dissolved fraction) exceed the Chronic Criteria (2.3 µg/l) and the two highest reported concentrations of Copper (total recoverable fraction) exceed the Chronic Criteria (2.4 µg/l), presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Copper. Effluent Limitations are necessary.

Final Concentration-Based Effluent Limitations for copper
When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to guidance from the SWRCB, Effluent Limitations based on upstream hardness are overprotective, while the protection provided by Effluent Limits based on the hardness of the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for Copper, based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in the proposed Order.

While the Copper Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Copper. (The conversion factor for Copper is discussed above.) Therefore, the calculations to determine the Copper Effluent Limitations were restricted to the data expressed as total recoverable Copper.

In addition, the NPDES regulations, at 40 CFR 122.45(d) and reiterated in the SIP for CTR constituents, require that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for Publicly Owned Treatment Works (POTWs). In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted. The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, and is shown below for Copper:

Step 1: Identify applicable water quality criteria, C:

- Chronic Criteria for Copper = $C_{chronic}$ = CCC (Criteria Continuous Concentration)
- Acute Criteria for Copper = C_{acute} = CMC (Criteria Maximum Concentration)

Step 2: For each criterion, calculate the Effluent Concentration Allowance (ECA):

- $ECA = C + D(C - B)$ when $C > B$, and
- $ECA = C$ when $C \leq B$, and/or $D = 0$

Where: B = ambient background concentration
D = dilution credit

For Copper, D = 0, therefore

$\Rightarrow ECA = C$

$\Rightarrow ECA_{chronic} = C_{chronic} = CCC = e^{\{0.8545[ln(hardness)] - 1.702\}}$

$\Rightarrow ECA_{acute} = C_{acute} = CMC = e^{\{0.9422[ln(hardness)] - 1.700\}}$

Step 3: For each ECA, determine each Long-Term Average discharge condition (LTA):

- $LTA_{chronic} = ECA_{chronic} \times ECA_{chronic\ multiplier\ 99}$
  $= CCC \times ECA_{chronic\ multiplier\ 99}$

- $LTA_{acute} = ECA_{acute} \times ECA_{acute\ multiplier\ 99}$
  $= CMC \times ECA_{acute\ multiplier\ 99}$

Where: $ECA_{chronic\ multiplier\ 99}$ and $ECA_{acute\ multiplier\ 99}$ are from Table 1 of the SIP, or calculated as follows:

$ECA_{chronic\ multiplier\ 99} = e^{\{0.5\sigma_4^2 - z\sigma_4\}}$

$= e^{\{0.5[ln(Cv^2/4 + 1)] - 2.326\sqrt{ln(Cv^2/4 + 1)}\}}$

$$ECA_{acute\ multiplier\ 99} = e^{\{0.5\sigma^2 - z\sigma\}}$$
$$= e^{\{0.5[ln(Cv^2 + 1)] - 2.326\sqrt{ln(Cv^2 + 1)}\}}$$

Where: σ = Standard Deviation = $\sqrt{ln(C_V^2 + 1)}$

$\sigma^2 = ln(C_V^2 + 1)$

$\sigma_4 = \sqrt{ln(C_V^2/4 + 1)}$

$\sigma_4^2 = ln(C_V^2/4 + 1)$

z = 2.326 for 99th percentile probability basis

- For Total Recoverable Copper:
(Coefficient of Variation calculation shown below *),
$\Rightarrow C_V = 0.37$

$$ECA_{chronic\ multiplier\ 99} = e^{\{0.5[ln((0.37)^2/4 + 1)] - 2.326\sqrt{ln((0.37)^2/4 + 1)}\}}$$
$$= e^{\{0.5[ln((0.1369)/4 + 1)] - 2.326\sqrt{ln((0.1369)/4 + 1)}\}}$$
$$= e^{\{0.5[ln(0.0342 + 1)] - 2.326\sqrt{ln(0.0342 + 1)}\}}$$
$$= e^{\{0.5[ln(1.0342)] - 2.326\sqrt{ln(1.0342)}\}}$$
$$= e^{\{0.5(0.0337) - 2.326\sqrt{0.0337}\}}$$
$$= e^{\{0.0168 - 2.326(0.1834)\}}$$
$$= e^{(0.0168 - 0.4267)}$$
$$= e^{(-0.4099)}$$
$$= 0.664$$

$$ECA_{acute\ multiplier\ 99} = e^{\{0.5[ln((0.37)^2 + 1)] - 2.326\sqrt{ln((0.37)^2 + 1)}\}}$$
$$= e^{\{0.5[ln(0.1369 + 1)] - 2.326\sqrt{ln(0.1369 + 1)}\}}$$
$$= e^{\{0.5[ln(1.1369)] - 2.326\sqrt{ln(1.1369)}\}}$$
$$= e^{\{0.5(0.1283) - 2.326\sqrt{0.1283}\}}$$
$$= e^{\{0.0642 - 2.326(0.3582)\}}$$
$$= e^{(0.0642 - 0.8332)}$$
$$= e^{(-0.7690)}$$
$$= 0.463$$

$$\Rightarrow LTA_{chronic} = CCC \times ECA_{chronic\ multiplier\ 99}$$
$$= CCC \times 0.664$$

$= 0.664CCC$

$\Rightarrow \quad LTA_{acute} = CMC \times ECA_{acute\ multiplier\ 99}$
$= CMC \times 0.463$
$= 0.463CMC$

Step 4: Select the lowest LTAs from *Step 3*:

- $LTA_{min} = \min(0.664CCC, 0.463CMC)$

For Total Recoverable Copper

- $CCC = e^{\{0.8545[ln(hardness)] - 1.702\}}$
- $CMC = e^{\{0.9422[ln(hardness)] - 1.700\}}$

Step 5: Calculate water quality based Effluent Limitations; an Average Monthly Effluent Limitation (AMEL) and a Maximum Daily Effluent Limitation (MDEL):

- $AMEL = LTA_{min} \times AMEL_{multiplier\ 95}$
- $MDEL = LTA_{min} \times MDEL_{multiplier\ 99}$

Where: $AMEL_{multiplier\ 95}$ and $MDEL_{multiplier\ 99}$ are from Table 2 of the SIP, or calculated as follows:

$$AMEL_{multiplier\ 95} = e^{\{z\sigma_n - 0.5\sigma_n^2\}}$$
$$= e^{\{z\sqrt{ln(Cv^2/n + 1)} - 0.5[ln(Cv^2/n + 1)]\}}$$

Where: $\sigma_n = \sqrt{ln(C_v^2/n + 1)}$
$\sigma_n^2 = ln(C_v^2/n + 1)$
$z = 1.645$ for 95th percentile probability basis
$n =$ number of samples per month (If the sampling frequency is four times a month or less, $\therefore n = 4$)

$$MDEL_{multiplier\ 99} = e^{\{z\sigma - 0.5\sigma^2\}}$$
$$= e^{\{z\sqrt{ln(Cv^2 + 1)} - 0.5[ln(Cv^2 + 1)]\}}$$

Where: $\sigma = \sqrt{ln(C_v^2 + 1)}$
$\sigma^2 = ln(C_v^2 + 1)$
$z = 2.326$ for 99th percentile probability basis

- For Total Recoverable Copper:
  (C_V = 0.37, n = 4, and $z_{95th\ Percentile}$ = 1.645, $z_{99th\ Percentile}$ = 2.326)

$$AMEL_{multiplier\ 95} = e^{\{z_{95}\sqrt{ln(Cv^2/n + 1)} - 0.5[ln(Cv^2/n + 1)]\}}$$
$$= e^{\{(1.645)\sqrt{ln((0.37)^2/4 + 1)} - 0.5[ln((0.37)^2/4 + 1)]\}}$$
$$= e^{\{(1.645)\sqrt{ln((0.1369)/4 + 1)} - 0.5[ln((0.1369)/4 + 1)]\}}$$
$$= e^{\{(1.645)\sqrt{ln(0.0342 + 1)} - 0.5[ln(0.0342 + 1)]\}}$$
$$= e^{\{(1.645)\sqrt{ln(1.0342)} - 0.5[ln(1.0342)]\}}$$
$$= e^{\{(1.645)\sqrt{0.0337)} - 0.5(0.0337)\}}$$
$$= e^{\{(1.645)(0.1834) - 0.0168\}}$$
$$= e^{(0.3018 - 0.0168)}$$
$$= e^{0.2850}$$
$$AMEL_{multiplier\ 95} = 1.33$$

$$MDEL_{multiplier\ 99} = e^{\{z_{99}\sqrt{ln(Cv^2 + 1)} - 0.5[ln(Cv^2 + 1)]\}}$$
$$= e^{\{(2.326)\sqrt{ln((0.37)^2 + 1)} - 0.5[ln((0.37)^2 + 1)]\}}$$
$$= e^{\{(2.326)\sqrt{ln(0.1369 + 1)} - 0.5[ln(0.1369 + 1)]\}}$$
$$= e^{\{(2.326)\sqrt{ln(1.1369)} - 0.5[ln(1.1369]\}}$$
$$= e^{\{(2.326)\sqrt{0.1283} - 0.5(0.1283)\}}$$
$$= e^{\{(2.326)(0.3582) - 0.0642\}}$$
$$= e^{(0.8332 - 0.0642)}$$
$$= e^{(0.7690)}$$
$$MDEL_{multiplier\ 99} = 2.16$$

- $AMEL = LTA_{min} \times AMEL_{multiplier\ 95}$
  $AMEL = LTA_{min} \times 1.33$
  $AMEL = 1.33(LTA_{min})$
  $AMEL = 1.33[min(0.664CCC, 0.463CMC)]$

- $MDEL = LTA_{min} \times MDEL_{multiplier\ 99}$
  $MDEL = LTA_{min} \times 2.16$
  $MDEL = 2.16(LTA_{min})$
  $MDEL = 2.16[min(0.664CCC, 0.463CMC)]$

SUMMARY: For Total Recoverable Copper:

- AMEL = 1.33[min(0.664CCC, 0.463CMC)]
- MDEL = 2.16[min(0.664CCC, 0.463CMC)]

Where:

- CCC = $e^{\{0.8545[ln(\text{hardness})] - 1.702\}}$
- CMC = $e^{\{0.9422[ln(\text{hardness})] - 1.700\}}$

* Calculation of C_V for Total Recoverable Copper Data:

Note: If the number of effluent data points is less than ten, or at least 80% of the data are reported as not detected, the C_V shall be set equal to 0.6. If an effluent data point is below the detection limit for the constituent in that sample, one-half of the detection limit shall be used as a value in the calculations.

Y	f	fY	$y = \lvert Y - \overline{Y} \rvert$	y^2	fy^2
0.88	1	0.88	0.87	0.7569	0.7569
0.92	1	0.92	0.83	0.6889	0.6889
1.07	1	1.07	0.68	0.4624	0.4624
1.49	1	1.49	0.26	0.0676	0.0676
1.52	2	3.04	0.23	0.0529	0.1058
1.78	1	1.78	0.03	0.0009	0.0009
1.97	1	1.97	0.22	0.0484	0.0484
2.05	1	2.05	0.30	0.0900	0.0900
2.22	1	2.22	0.47	0.2209	0.2209
2.68	1	2.68	0.93	0.8649	0.8649
2.93	1	2.93	1.18	1.3924	1.3924
Totals	$\sum f = 12$	$\sum fY = 21.03$			$\sum fy^2 = 4.6991$

Copper Concentration (µg/l) = Y
Frequency = f
Number of Samples = $n = \sum f = 12$

Mean = $\overline{Y} = \frac{\sum fY}{n} = \frac{21.03}{12} = 1.75$

Standard Deviation = $S = \sqrt{\frac{\sum fy^2}{n-1}} = \sqrt{\frac{4.6991}{11}} = \sqrt{0.4272} = 0.6536$

Coefficient of Variation = $C_V = \frac{S}{} = \frac{0.6536}{} = 0.37$

$\overline{Y}$ 1.75

Concentration-Based Final Effluent Limitations for copper
The Table and equations shown in Attachment F represent the Acute and Chronic hardness-dependent Copper Criteria as Total Recoverable Copper. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Copper concentrations using the Table shown in Attachment F and/or the equations shown above and in Attachment F, and the effluent Copper and R2 hardness data collected according to the attached Monitoring and Reporting Program.

For Total Recoverable Copper:

- AMEL = 1.33[min(0.664CCC, 0.463CMC)]
- MDEL = 2.16[min(0.664CCC, 0.463CMC)]

Where:

- $CCC = e^{\{0.8545[ln(\text{hardness})] - 1.702\}}$
- $CMC = e^{\{0.9422[ln(\text{hardness})] - 1.700\}}$

Mass-Based Final Effluent Limitations for Copper
Mass-based final Effluent Limitations for Copper, in lbs/day, are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated as described above and according to Attachment F, and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day). The calculations will be similar to those shown above, for Aluminum.

Interim Effluent Limitations for Copper
If a compliance schedule is granted for implementation of the final Effluent Limitations for Copper, then the interim Daily Maximum Effluent Limitation for Copper may be calculated using the procedure outlined above in the introduction to this Section:

n = 12 and **Highest Value = 2.93 µg/l** (Total Recoverable Copper)

n = 12 $\Rightarrow$ $\mathbf{C_V = 0.37}$

$\mathbf{C_V = 0.37}$ $\Rightarrow$ **Multiplication Factor = 2.16** (Table 5-2 of the TSD, 99th Percentile)

Interim Effluent Limitation for Copper:
$\Rightarrow$ 2.93 µg/l x 2.16 = 6.33 µg/l as a Daily Maximum

Dioxins and Furans
The toxic effects of 2,3,7,8-TCDD (Tetrachlorodibenzo-p-dioxin) commonly known as Dioxin, have been well documented. The many congeners (variations) of the Chlorinated Dibenzodioxins (Dioxins)

and Chlorinated Dibenzofurans (Furans) exhibit toxic effects similar to those of 2,3,7,8-TCDD. The U.S. EPA has published Toxic Equivalency Factors (TEFs) for 17 of the congeners. The TEFs express the relative toxicities of the congeners compared to 2,3,7,8-TCDD, which has a TEF equal to 1.0:

Toxic Equivalency Factors (TEFs) for 2,3,7,8-TCDD Equivalents

Congener	TEF
2,3,7,8-TCDD	1
1,2,3,7,8-PentaCDD	1.0
1,2,3,4,7,8-HexaCDD	0.1
1,2,3,6,7,8-HexaCDD	0.1
1,2,3,7,8,9-HexaCDD	0.1
1,2,3,4,6,7,8-HeptaCDD	0.01
OctaCDD	0.0001
2,3,7,8-TetraCDF	0.1
1,2,3,7,8-PentaCDF	0.05
2,3,4,7,8-PentaCDF	0.5
1,2,3,4,7,8-HexaCDF	0.1
1,2,3,6,7,8-HexaCDF	0.1
1,2,3,7,8,9-HexaCDF	0.1
2,3,4,6,7,8-HexaCDF	0.1
1,2,3,4,6,7,8-HeptaCDF	0.01
1,2,3,4,7,8,9-HeptaCDF	0.01
OctaCDF	0.0001

For the Dioxins and Furans listed above, the CTR Criterion to protect Human Health (30-Day Average) for Drinking Water Sources (consumption of water and aquatic organisms) is 0.000000013 µg/l (1.3×10^{-8} µg/l or 1.3×10^{-14} g/l). The criterion applies to the sum of the concentrations of 2,3,7,8-TCDD plus each of the congeners, after translation with the respective TEFs.

The Discharger collected five samples and had them analyzed for 2,3,7,8-TCDD and the congeners. Effluent monitoring results submitted by the Discharger (see Table 5) contained a concentration of 2,3,7,8-TCDD in one of the five samples at 3.33 pg/l (3.33×10^{-12} g/l or 3.33×10^{-6} µg/l where pg/l = picograms/liter = 10^{-12} g/l and 10^{-6} µg/l).

Two of the Dioxin and Furan congeners, OCDD (Octa Chlorinated Dibenzodioxin) and OCDF (Octa Chlorinated Dibenzofuran), were also detected in the effluent from SMD1. OCDD was detected in three of the five samples; after translation, the concentrations of OCDD were 0.000979, 0.00102, and 0.00228 pg/l (9.79×10^{-16}, 1.02×10^{-15}, and 2.28×10^{-15} g/l). OCDF was detected in one of the five samples; after translation, OCDF was reported at a concentration of 0.000951 pg/l (9.51×10^{-16} g/l). The OCDD concentration of 0.00228 pg/l and OCDF concentration of 0.000951 pg/l were detected in the same sample.

The sample with the reported concentration of 2,3,7,8-TCDD (3.33×10^{-12} g/l), which was also the sum of the congeners in that sample, exceeds the CTR criterion (1.3×10^{-14} g/l). The sums of the concentrations of OCDD and OCDF in the other samples did not exceed the criterion. To protect the drinking water beneficial uses of the receiving waters, a new concentration-based final Effluent Limitation for Dioxins and Furans, based on the CTR Criterion, is included in the proposed Order:

Final Concentration-based Effluent Limitation for Dioxins and Furans:
$\Rightarrow$ 1.3×10^{-8} µg/l as a Monthly Average

Mass-based final Effluent Limitations for Dioxins and Furans are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The mass limit for the Dioxins and Furans is calculated using the concentration-based Effluent Limitation of 1.3×10^{-8} µg/l (1.3×10^{-11} mg/l) and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitation for Dioxins and Furans:
$\Rightarrow$ 1.3×10^{-11} mg/l x 8.345 x 2.18 MGD $\cong 2.36 \times 10^{-10}$ lbs/day as a Monthly Average

If a compliance schedule is granted for implementation of the final Effluent Limitations for Dioxins and Furans, then an interim Daily Maximum Effluent Limitation for Dioxins and Furans is calculated using the procedure outlined above in the introduction to this Section:

n = 5 and **Highest Value = 3.33 pg/l (3.33×10^{-6} µg/l)**

$n < 10 \Rightarrow C_V = 0.6$

$C_V = 0.6 \Rightarrow$ Multiplication Factor = 3.11 (Table 5-2 of the TSD)

Interim Effluent Limitation for Dioxins and Furans:
$\Rightarrow$ 3.33 pg/l x 3.11 = 10.36 pg/l (10.36×10^{-6} µg/l) as a Daily Maximum

Lead

The toxicity of Lead to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Lead to aquatic life increases. The CTR Lead Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Lead Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for both the Acute and Chronic Lead Criteria is: CF = 1.46203 – {[ln(hardness)](0.145712)}. The equations to calculate the Lead Criteria (expressed as the dissolved fraction and including the conversion factor) are:

$$CCC = \left(e^{\{1.273[ln(\text{hardness})] - 4.705\}}\right) x \left(1.46203 - \{[\ln(\text{hardness})](0.145712)\}\right)$$

$$CMC = \left(e^{\{1.273[ln(hardness)] - 1.460\}}\right)x\left(1.46203 - \{[\ln(hardness)](0.145712)\}\right)$$

The equations to calculate the Lead Criteria (expressed as total recoverable fraction) are:

$$CCC = \left(e^{\{1.273[ln(hardness)] - 4.705\}}\right)$$

$$CMC = \left(e^{\{1.273[ln(hardness)] - 1.460\}}\right)$$

Effluent monitoring data submitted by the Discharger (see Table 1) contained concentrations of dissolved Lead, in twelve samples, at 0.041, 0.368, 0.424, 0.513, 0.558, 0.567, 0.591, 0.750, 0.926, 1.008, 1.21, and 1.51 µg/l, and concentrations of total recoverable Lead, in twelve samples, at 0.130, 0.387, 0.430, 0.539, 0.549, 0.585, 0.602, 0.772, 0.996, 1.046, 1.260, and 1.490 µg/l.

Reasonable Potential Analysis for Lead
The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Lead fraction) are calculated to be 1.46 µg/l and 37.56 µg/l, respectively. The highest reported dissolved Lead concentration **exceeded** the Chronic Criterion for dissolved Lead. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Lead fraction) are calculated to be 1.70 µg/l and 43.52 µg/l. None of the total recoverable Lead concentrations exceeded the Lead Criteria calculated with a hardness of 61 mg/l. However, the highest reported dissolved Lead concentration exceeded the Acute Criterion for dissolved Lead, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Lead.

In addition, the Discharger submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Lead fraction) are calculated to be 0.42 µg/l and 10.79 µg/l, respectively. The ten highest reported dissolved Lead concentrations **exceeded** the Chronic Criterion. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Lead fraction) are calculated to be 0.41 µg/l and 10.52 µg/l, respectively. The ten highest reported total recoverable Lead concentrations **exceeded** the Chronic Criterion. With a receiving water hardness of 20 mg/l, the majority of the reported concentrations of dissolved and total recoverable Lead exceeded the Chronic Criteria, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Lead. Effluent Limitations are necessary.

Final Concentration-Based Effluent Limitations for lead

When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to guidance from the SWRCB, Effluent Limitations based on upstream hardness are overprotective, while the protection provided by Effluent Limits based on the hardness of the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for Lead, based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in the proposed Order.

Concentration-Based Final Effluent Limitations for lead
While the Lead Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Lead. (The conversion factor for Lead is discussed above.) Therefore, the calculations to determine the Lead Effluent Limitations were restricted to the data expressed as total recoverable Lead.

In addition, the NPDES regulations at 40 CFR 122.45(d) require that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for Publicly Owned Treatment Works (POTWs). In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted. The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, the complete calculation process is shown above for Copper, and the results of the calculations for the Lead Effluent Limitations are summarized below:

For Total Recoverable Lead:

- AMEL = 1.49[min(0.559CCC, 0.350CMC)]
- MDEL = 2.85[min(0.559CCC, 0.350CMC)]

Where:

- $CCC = e^{\{1.273[ln(hardness)] - 4.705\}}$
- $CMC = e^{\{1.273[ln(hardness)] - 1.460\}}$

The Table and equations shown in Attachment G represent the Acute and Chronic hardness-dependent Lead Criteria as Total Recoverable Lead. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Lead concentrations using the Table shown in Attachment G and/or the equations shown above and in Attachment G, and the effluent Lead and R2 hardness data collected according to the attached Monitoring and Reporting Program.

Mass-Based Final Effluent Limitations for Lead
Mass-based final Effluent Limitations for Lead, in lbs/day, are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated using the equations shown above and according to Attachment G, and the mass-calculation equations explained and shown above in

Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day). The calculations will be similar to those shown above, for Aluminum.

Interim Effluent Limitations for Lead
If a compliance schedule is granted for implementation of the final Effluent Limitations for Lead, then an interim Daily Maximum Effluent Limitation for Lead may be calculated using the procedure outlined above in the introduction to this Section:

n = 12 and **Highest Value = 1.49 µg/l** (Total Recoverable Lead)

n = 12 ⇒ **C_V = 0.54**

C_V = 0.54 ⇒ **Multiplication Factor = 2.85** (Table 5-2 of the TSD, 99th Percentile)

Interim Effluent Limitation for Lead:
⇒ 1.49 µg/l x 2.85 = 4.25 µg/l as a Daily Maximum

PCBs (Polychlorinated Biphenyls)
PCBs are the chlorinated derivatives of a class of aromatic organic compounds called biphenyls (two joined benzene rings) and were manufactured by the direct chlorination of the biphenyl ring system. Commercial PCBs were complex mixtures of chemical isomers that differed in the amount of chlorination of the biphenyl ring structure. PCBs were marketed in four mixtures containing 21%, 41%, 42%, and 54% chlorine for use in closed electrical systems under the registered trademark Aroclor. PCBs are no longer manufactured in the United States. At one time, PCB mixtures of up to 68% chlorine were used for other applications, including plasticizers, heat transfer fluids, hydraulic fluids, fluids in vacuum pumps and compressors, lubricants, and wax extenders. Because each component of the mixtures differs slightly in its physical, chemical, and biological properties, and because a possible 209 isomers exist, the evaluation of the potential impact of the various mixtures on the environment is complicated.

PCBs are considered to be inert to almost all of the typical chemical reactions and do not undergo oxidation, reduction, addition, elimination, or electrophilic substitution reactions except under extreme conditions. Therefore, PCBs are extremely long-lived and widely disseminated in the environment. In aquatic environments, PCBs are associated with sediments and are usually found at much higher concentrations in sediments than in water. The solubility of PCBs in water is very low, decreasing as the percent chlorination is increased. PCBs are strongly adsorbed to solid surfaces including glass, metal, soils, sediments, and particulates in the environment. PCBs are highly lipophilic (adsorbed by fatty tissues in living organisms) and bioconcentrate to high concentrations in the tissues and in food webs. Relatively low concentrations of PCBs in water can result in relatively high concentrations of PCBs in tissues. PCBs have caused profound toxic effects particularly with repeated exposure. Routes of PCB exposure include ingestion of water and food, inhalation, and dermal contact. The skin, liver, gastrointestinal tract, and nervous system are sites of PCB pathology.

The CTR Criterion for PCBs to protect Human Health (30-Day average) for Drinking Water Sources (consumption of water and aquatic organisms) is 0.00017 µg/l and applies to the sum of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260. The CTR Criterion for the Protection of Freshwater Aquatic Life, Continuous Concentration (4-Day Average) is 0.014 µg/l and applies to each Aroclor, individually.

Effluent monitoring results submitted by the Discharger (see Table 4) contained concentrations of three PCB mixtures marketed as Aroclor 1016, Aroclor 1221, and Aroclor 1260, in two of five samples. Aroclor 1016 was estimated by the laboratory to be present at a concentration of 0.26 µg/l, Aroclor 1221 was detected at a concentration of 5.7 µg/l, and Aroclor 1260 was reported by the laboratory to be present at a concentration of 0.078 µg/l. Aroclors 1016 and 1260 were reported in the same sample. All three concentrations exceed both the CTR Human Health and Aquatic Life Criteria. The concentration of 5.7 µg/l was the highest sum of the Aroclors detected.

The detection of Aroclor 1221 and estimated concentrations of Aroclors 1016 and 1260 represent a reasonable potential to cause or contribute to an in-stream excursion above the CTR Criteria for PCBs, individually, and in total.

To protect the drinking water beneficial use of the receiving waters, a new concentration-based final Effluent Limitation for the sum of all the Aroclors based on the CTR Criterion, is included in the proposed Order:

Final Concentration-based Effluent Limitation, Sum of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260:

⇒ 0.00017 µg/l as a Monthly Average

To protect the habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for the individual PCBs, Aroclor 1016, Aroclor 1221, and Aroclor 1260, based on the CTR Criterion, are also included in the proposed Order. The NPDES regulations at 40 CFR 122.45(d) require that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for Publicly Owned Treatment Works (POTWs). In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted. The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, the complete calculation process is shown above for Copper, and the results of the calculations for the individual PCB Aroclor Effluent Limitations are summarized below:

Final Concentration-based Effluent Limitations for each PCB; Aroclor 1016, Aroclor 1221, and Aroclor 1260:

- AMEL = Average Monthly Effluent Limitation
  $= LTA_{min} \times AMEL_{multiplier\ 95}$
  $= LTA_{chronic} \times AMEL_{multiplier\ 95}$
  $= CCC \times ECA_{chronic\ multiplier\ 99} \times AMEL_{multiplier\ 95}$

= (0.014 µg/l) x (0.527) x (1.55)
= 0.0114 µg/l

- MDEL = Maximum Daily Effluent Limitation
  = LTA_{min} x $MDEL_{multiplier\ 99}$
  = $LTA_{chronic}$ x $MDEL_{multiplier\ 99}$
  = CCC x $ECA_{chronic\ multiplier\ 99}$ x $MDEL_{multiplier\ 99}$
  = (0.014 µg/l) x (0.527) x (3.11)
  = 0.0230 µg/l

Mass-based final Effluent Limitations for the sum of the Aroclors and also for the individual PCBs, Aroclor 1016, Aroclor 1221, and Aroclor 1260, are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The PCB mass limits are calculated using the concentration-based Effluent Limitations of 0.00017 µg/l (0.00000017 mg/l) for the sum of the Aroclors, the AMEL of 0.0114 µg/l (0.0000114 mg/l) and MDEL of 0.0230 µg/l (0.0000230 mg/l) for the individual Aroclors, and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Final Mass-based Effluent Limitation for the Sum of the Aroclors:
⇒ 0.00000017 mg/l x 8.345 x 2.18 MGD ≅ 0.00000309 lbs/day as a Monthly Average

Final Mass-based Effluent Limitation for Individual Aroclors 1016, 1221, and 1260:
⇒ 0.0000114 mg/l x 8.345 x 2.18 MGD ≅ 0.000207 lbs/day as a Monthly Average
⇒ 0.0000203 mg/l x 8.345 x 2.18 MGD ≅ 0.000369 lbs/day as a Daily Maximum

If a compliance schedule is granted for implementation of the final Effluent Limitations for the sum of the Aroclors and the individual Aroclors 1016, 1221, and 1260, then interim Daily Maximum Effluent Limitations for the sum of the Aroclors and the individual Aroclors 1016, 1221, and 1260 are calculated using the procedure outlined above in the introduction to this Section:

For the sum of the Aroclors and Aroclor 1221;

n = 5 and **Highest Value = 5.7 µg/l**

n < 10 ⇒ **C_V = 0.6**

C_V = 0.6 ⇒ **Multiplication Factor = 3.11** (Table 5-2 of the TSD)

Interim Effluent Limitations for the sum of the Aroclors:
⇒ 5.7 µg/l x 3.11 = 17.73 µg/l as a Daily Maximum

Interim Effluent Limitations for Aroclor 1221:
⇒ 5.7 µg/l x 3.11 = 17.73 µg/l as a Daily Maximum

For Aroclor 1016;

n = 5 and **Highest Value = 0.26 µg/l**

n < 10 ⇒ **C_V = 0.6**

C_V = 0.6 ⇒ **Multiplication Factor = 3.11** (Table 5-2 of the TSD)

Interim Effluent Limitations for Aroclor 1016:
⇒ 0.26 µg/l x 3.11 = 0.81 µg/l as a Daily Maximum

For Aroclor 1260

n = 5 and **Highest Value = 0.078 µg/l**
n < 10 ⇒ **C_V = 0.6**

C_V = 0.6 ⇒ **Multiplication Factor = 3.11** (Table 5-2 of the TSD)

Interim Effluent Limitation for Aroclor 1260:
⇒ 0.078 µg/l x 3.11 = 0.24 µg/l as a Daily Maximum

Calculation procedures for C_V are shown in the discussions for Chloride and Copper.

Silver
The toxicity of Silver to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Silver to aquatic life increases. The CTR Silver Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent and may be represented in tabular or graphic form, or by an equation. The Silver Criteria (expressed as dissolved metal) are presented as Acute or Instantaneous Maximum Concentrations (CMC or 1-Hour Average) with no Chronic Criteria. The CTR contains a conversion factor to translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for the Silver Criteria is: CF = 0.85. The equation to calculate the Silver Criteria (expressed as the dissolved fraction and including the conversion factor) is:

$$\text{Criteria Maximum Concentration (1-Hour Ave.)} = \text{CMC} = \left(e^{\{1.72[ln(\text{hardness})] - 6.52\}}\right) x \left(0.850\right)$$

The equation to calculate the Silver Criteria (expressed as total recoverable fraction) is:

$$\text{Criteria Maximum Concentration (1-Hour Ave.)} = \text{CMC} = \left(e^{\{1.72[ln(\text{hardness})] - 6.52\}}\right)$$

Effluent monitoring data submitted by the Discharger (see Table 1) contained concentrations of dissolved Silver, in five of twelve samples, at 0.002, 0.005, 0.017, 0.025, and 0.110 µg/l, and total recoverable Silver, in ten of twelve samples, at 0.020, 0.025, 0.027, 0.033, 0.034, 0.045, 0.065, 0.077, 0.095, and 0.431 µg/l.

Reasonable Potential Analysis for silver
The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Acute Criterion (expressed as the dissolved Silver fraction) is calculated to be 1.5 µg/l. Similarly, the Acute Criterion (expressed as the total recoverable Copper fraction) is calculated to be 1.7 µg/l. None of the Silver concentrations exceeded the Criteria calculated using the effluent hardness of 61 mg/l; therefore, the hardness and Copper concentrations in the effluent alone do not create toxic conditions.

However, the Discharger also submitted hardness data, for Rock Creek upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the equations shown above, the Acute Criterion (expressed as the dissolved Silver fraction) is calculated to be 0.22 µg/l. Similarly, the Acute Criterion (expressed as the total recoverable Silver fraction) is calculated to be 0.25 µg/l. With a receiving water hardness of 20 mg/l, the highest reported concentration of Silver (total recoverable fraction) exceeds the Acute Criterion (0.25 µg/l), presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Silver. Effluent Limitations are necessary.

Final Concentration-Based Effluent Limitations for silver
When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to guidance from the SWRCB, Effluent Limitations based on upstream hardness are overprotective, while the protection provided by Effluent Limits based on the hardness of the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for Silver, based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in the proposed Order.

Concentration-Based Final Effluent Limitations for Silver
While the Silver Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Silver. (The conversion factor for Silver is discussed above.) Therefore, the calculations to determine the Silver Effluent Limitations were restricted to the data expressed as total recoverable Silver.

In addition, the NPDES regulations at 40 CFR 122.45(d) requires that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for Publicly Owned Treatment Works (POTWs). In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and

maximum daily limits, must be converted. The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, the complete calculation process is shown above for Copper, and the results of the calculations for the Silver Effluent Limitations are summarized below:

For Total Recoverable Silver:

- AMEL = 2.48(0.137CMC)
- MDEL = 7.29(0.137CMC)

Where:

- $CMC = e^{\{1.72[ln(hardness)] - 6.52\}}$

The Table and equations shown in Attachment H represent the Instantaneous Maximum hardness-dependent Silver Criteria as Total Recoverable Silver. The Discharger must calculate the final Effluent Limitations for Instantaneous Maximum Silver concentrations using the Table shown in Attachment H and/or the equations shown above and in Attachment H, and the effluent Silver and R2 hardness data collected according to the attached Monitoring and Reporting Program.

Mass-Based Final Effluent Limitations for Silver

Mass-based final Effluent Limitations for Silver, in lbs/day, are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated using the equations shown above and according to Attachment H, and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day). The calculations will be similar to those shown above, for Aluminum.

Interim Effluent Limitations for Silver

If a compliance schedule is granted for implementation of the final Effluent Limitations for Silver, then an interim Daily Maximum Effluent Limitation for Silver may be calculated using the procedure outlined above in the introduction to this Section:

n = 12 and **Highest Value = 0.431 µg/l** (Total Recoverable Silver)

n = 12 ⇒ **C_V = 1.6**

C_V = 1.6 ⇒ **Multiplication Factor = 7.29** (Table 5-2 of the TSD, 99th Percentile)

Interim Effluent Limitation for Silver:

⇒ 0.431 µg/l x 7.29 = 3.14 µg/l as a Daily Maximum

Calculation procedures for C_V are shown in the discussions for Chloride and Copper.

Zinc

The toxicity of Zinc to aquatic life varies with hardness. As hardness concentrations decrease, the toxicity of Zinc to aquatic life increases. The CTR Zinc Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent and may be represented in tabular or graphic form, or by equations. The Zinc Criteria (expressed as dissolved metal) are presented as both Chronic or Continuous Concentrations (CCC or 4-Day Average) and Acute or Maximum Concentrations (CMC or 1-Hour Average). The CTR contains conversion factors that translate the total recoverable metal fraction to the dissolved fraction. The conversion factor, for the Acute Zinc Criteria is: CF = 0.978. The conversion factor, for the Chronic Zinc Criteria is: CF = 0.986. The equations to calculate the Zinc Criteria (expressed as the dissolved fraction and including the conversion factor) are:

$$CCC = \left(e^{\{0.8473[ln(\text{hardness})] + 0.884\}}\right)x\left(0.986\right)$$

$$CMC = \left(e^{\{0.8473[ln(\text{hardness})] + 0.884\}}\right)x\left(0.978\right)$$

The equation to calculate both Lead Criteria (expressed as total recoverable fraction) is:

$$CCC = CMC = \left(e^{\{0.8473[ln(\text{hardness})] + 0.884\}}\right)$$

Effluent monitoring data submitted by the Discharger (see Table 1) contained concentrations of dissolved Zinc, in twelve samples, at 6.16, 25.2, 25.5, 26.4, 27.3, 27.8, 28.5, 28.8, 31.7, 33.5, 34.4, and 72.2 µg/l, and total recoverable Zinc, in twelve samples, at 7.40, 21.8, 26.2, 26.5, 26.8, 27.8, 28.7, 28.7, 29.2, 32.7, 33.6, and 34.5 µg/l.

Reasonable Potential Analysis for zinc

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the effluent hardness of 61 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Zinc fraction) are calculated to be 78 µg/l and 77 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Zinc fraction) are calculated to be 79 µg/l and 77 µg/l. None of the Zinc concentrations exceeded the Zinc Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Zinc concentrations in the effluent alone do not create toxic conditions.

However, the Discharger also submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Zinc fraction) are calculated to be 30 µg/l and 30 µg/l, respectively. The four highest reported dissolved Zinc concentrations **exceeded** the Acute and Chronic Criteria. Similarly,

the Chronic and Acute Criteria (expressed as the total recoverable Zinc fraction) are calculated to be 31 µg/l and 30 µg/l, respectively. The three highest reported total recoverable Zinc concentrations **exceeded** the Acute and Chronic Criteria. With a receiving water hardness of 20 mg/l, several of the reported concentrations of dissolved and total recoverable Zinc exceeded the Acute and Chronic Criteria, presenting a reasonable potential to cause, or contribute to an in-stream excursion above the CTR Criteria for Zinc. Effluent Limitations are necessary.

Final Concentration-Based Effluent Limitations for zinc
When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to guidance from the SWRCB, Effluent Limitations based on upstream hardness are overprotective, while the protection provided by Effluent Limits based on the hardness of the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations for Zinc, based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in the proposed Order.

Concentration-Based Final Effluent Limitations for Zinc
While the Zinc Criteria are presented as dissolved concentrations, Effluent Limitations must be expressed as the total recoverable fraction of Zinc. (The conversion factor for Zinc is discussed above.) Therefore, the calculations to determine the Zinc Effluent Limitations were restricted to the data expressed as total recoverable Zinc.

In addition, the NPDES regulations at 40 CFR 122.45(d) requires that all permit limits be expressed, unless impracticable, as both average monthly and average weekly values for Publicly Owned Treatment Works (POTWs). In lieu of the average weekly limits for POTWs, U.S. EPA recommends establishing maximum daily effluent limits. Water quality criteria, which are not expressed as average monthly and maximum daily limits, must be converted. The Effluent Limitation conversion process is outlined in Section 1.4B of the SIP, the complete calculation process is shown above for Copper, and the results of the calculations for the Zinc Effluent Limitations are summarized below:

For Total Recoverable Zinc:

- AMEL = 1.23[min(0.746CCC, 0.570CMC)]
- MDEL = 1.75[min(0.746CCC, 0.570CMC)]

Where:

- $CCC = CMC = \left(e^{\{0.8473[ln(\text{hardness})] + 0.884\}}\right)$

The Table and equations shown in Attachment I represent the Acute and Chronic hardness-dependent Lead Criteria as Total Recoverable Zinc. The Discharger must calculate the final Effluent Limitations for Acute and Chronic Zinc concentrations using the Table shown in Attachment I and/or the equation

shown above and in Attachment I, and the effluent Zinc and R2 hardness data collected according to the attached Monitoring and Reporting Program.

Mass-Based Final Effluent Limitations for Zinc
Mass-based final Effluent Limitations for Zinc, in lbs/day, are also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated using the equations shown above and according to Attachment I, and the mass-calculation equations explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day). The calculations will be similar to those shown above, for Aluminum.

Interim Effluent Limitations for Zinc
If a compliance schedule is granted for implementation of the final Effluent Limitations for Zinc, then an interim Daily Maximum Effluent Limitation for Zinc may be calculated using the procedure outlined above in the introduction to this Section:

n = 12 and **Highest Value = 34.5 µg/l** (Total Recoverable Zinc)

n = 12 ⇒ **C_V = 0.26**

C_V = 0.26 ⇒ **Multiplication Factor = 1.76** (Table 5-2 of the TSD, 99th Percentile)

Interim Effluent Limitation for Zinc:
⇒ 34.5 µg/l x 1.76 = 60.72 µg/l as a Daily Maximum

Calculation procedures for C_V are shown in the discussions for Chloride and Copper.

Other Drinking Water Criteria for Chloroform
Municipal and domestic supply is a beneficial use of the receiving stream. The narrative toxicity objective and this beneficial use designation comprise a water quality standard applicable to pollutants in the receiving stream. On page IV-17.00, the Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations.

Effluent monitoring results submitted by the Discharger (see Table 2) indicated the presence of Chloroform, in eleven of twelve samples, at concentrations of 3.5, 5.6, 5.8, 5.9, 6.5, 8.0, 8.4, 9.2, 9.7, 11, and again at 11 µg/l.

The California EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including Chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within California EPA. The OEHHA cancer potency value for oral exposure to Chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicological

assumptions used by OEHHA and U.S. EPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/l (0.0011 mg/l) at the 1-in-a-million cancer risk level. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water.

The one-in-a-million cancer risk level is also mandated by U.S. EPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters. Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality standard for Chloroform. Therefore, an Effluent Limitation for Chloroform is included in the proposed Order and is based on the Basin Plan toxicity objective and OEHHA Toxicity Criteria for the protection of human health:

Concentration-based Effluent Limitation for Chloroform:
⇒ 1.1 µg/l as a Monthly Average

A mass-based Effluent Limitation for Chloroform is also included in the proposed Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Chloroform mass limit is calculated using the concentration-based Effluent Limitation (0.0011 µg/l) and the mass-calculation equation explained and shown above in Section XVI (*X* mg/l x 8.345 x 2.18 MGD = *Y* lbs/day).

Mass-based Effluent Limitation for Chloroform:
⇒ 0.0011 mg/l x 8.345 x 2.18 MGD ≅ 0.020 lbs/day as a Monthly Average

Bromodichloromethane, Bromoform, Chloroform, and Dibromochloromethane are collectively known as Total Trihalomethanes. U.S. EPA has established a PMCL for Total Trihalomethanes of 80 µg/l (the sum of the concentrations of the four constituents). Bromodichloromethane, Chloroform, and Dibromochloromethane were detected in the effluent from SMD1. Bromoform was not detected. The sums of the concentrations of Bromodichloromethane, Chloroform, and Dibromochloromethane do not exceed the PMCL. Individual Effluent Limitations for Chloroform and Bromodichloromethane in the proposed Order are protective of the drinking water beneficial uses and below the PMCL. Bromodichloromethane was detected at concentrations that exceeded CTR Criteria, and is discussed above. The concentration of Dibromochloromethane did not exceed water quality criteria and no effluent limitations are proposed for Dibromochloromethane.

Receiving Water Limitations

The Clean Water Act, Section 303(a-c), required states to adopt numeric criteria where they are necessary to protect designated uses. The Regional Board adopted numeric criteria in the Basin Plan. The Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality

control (40 CFR 131.20). State Board Resolution No. 68-16, the Antidegradation Policy, does not allow changes in water quality less than that prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that; "The numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses." The proposed Order contains Receiving Water Limitations based on the Basin Plan numerical and narrative water quality objectives for Biostimulatory Substances, Chemical Constituents, Color, Dissolved Oxygen, Floating Material, Oil and Grease, pH, Pesticides, Radioactivity, Salinity, Sediment, Settleable Material, Suspended Material, Tastes and Odors, Temperature, Toxicity and Turbidity.

Revised Receiving Water Limitations – DO, pH, Temperature, and Turbidity
Receiving Water Limitations are based on Basin Plan Water Quality Objectives. The discharge does has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan narrative Water Quality Objectives for Dissolved Oxygen (DO), pH, Temperature, and Turbidity. The existing Order contains Receiving Water Limitations that are not in conformance with the Basin Plan and/or not protective of the beneficial uses of the receiving water. The proposed Order contains Receiving Water Limitations for DO, pH, Temperature, and Turbidity that have been modified as described below:

Dissolved Oxygen (DO)
Existing Order No. 97-113 has a DO Receiving Water Limitation of 5 mg/l, which is the Basin Plan Water Quality Objective for warm-water fisheries. However, the Basin Plan contains a 7 mg/l DO Water Quality Objective for cold-water fisheries and for waters designated as suitable for spawning habitat. As discussed above, the beneficial uses of Rock Creek, Dry Creek, and Coon Creek include cold water and spawning beneficial uses. Therefore, the proposed Order contains a Receiving Water Limitation of 7 mg/l for DO.

pH
Existing Order No. 97-113 has a pH Receiving Water Limitation that applies a 30-Day averaging period to the ambient pH, as follows:

> *"9. The 30-day average ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units."*

The proposed Order contains a Receiving Water Limitation in which the 30-day averaging period is applied only to the change in pH, as follows:

> *"2. The ambient pH to fall below 6.5 or exceed 8.5, or the 30-day average ambient pH to change by more than 0.5 units."*

The Receiving Water Limitation in the proposed Order is more protective of beneficial uses and in conformance with the Basin Plan Water Quality Objective for pH, "*The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5...*"

Temperature
Existing Order No. 97-113 has a temperature Receiving Water Limitation that applies a 30-day averaging period to the ambient temperature, as follows:

> *"11. The 30-day average ambient temperature to increase more than 5°F."*

The proposed Order contains a Receiving Water Limitation that has no averaging period for temperature, as follows:

> *"3. The ambient temperature to increase more than 5°F."*

The Receiving Water Limitation in the proposed Order is more protective of beneficial uses and in conformance with the Basin Plan Water Quality Objective for temperature "*At no time or place shall temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.*" The Discharger has not demonstrated that an averaging period for temperature is protective of beneficial uses.

Turbidity
Existing Order No. 97-113 contains the following Receiving Water Limitation:

> *"8. The 30-day average for turbidity to increase as follows:*
>
> *a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.*
>
> *b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.*
>
> *c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.*
>
> *d. More than 10 percent where natural turbidity is greater than 100 NTUs."*

The proposed Order contains the following Receiving Water Limitation:

> *"4. The turbidity to increase as follows:*
>
> *a. (The 30-day average turbidity to increase) More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.*
>
> *b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.*
>
> *c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.*

d. More than 10 percent where natural turbidity is greater than 100 NTUs."

The Receiving Water Limitation has been changed so that the 30-day average applies only to part a. and no longer applies to parts b., c., and d. A tertiary plant is able to meet the limitations in parts b., c., and d. without an averaging period. However, a tertiary plant is not able to meet the limitations of part a. without an averaging period. Therefore, the 30-day averaging period is only applied to part a. During high storm flows and inflow to the plant, the wastewater discharged from the plant will be more dilute and less turbid. In addition, during high storm flows, the Receiving Water will have a higher relative turbidity. Therefore, the Turbidity Effluent Limitations in the proposed Order are protective of the Receiving Water Beneficial Uses.

CONSTITUENTS WITH NO LIMITATIONS

Agriculture Irrigation Objectives/Study - EC and TDS
As described above, agriculture irrigation is a beneficial use of the receiving waters, Rock Creek, Dry Creek, and downstream waters. Domestic and industrial use of water, results in an increase in the mineral content of the wastewater. The minerals include calcium, sodium, sulfate, and other dissolved salts, including chloride. When water evaporates, salts accumulate in soil. With increasing salinity in the soil of the root zone, plants expend more energy on adjusting the salt concentration in plant tissues to obtain needed water from the soil, and less energy is available for growth. The salinity of wastewater is determined by measuring EC or TDS, which may be used as parameters to determine the suitability of wastewater for irrigation.

Monitoring results submitted by the Discharger indicated that concentrations of Electrical Conductivity (EC) and Total Dissolved Solids (TDS) exceeded Agriculture Irrigation Objectives. However, no data was submitted by the Discharger to indicate the Agriculture Irrigation Objectives were exceeded in the receiving water. The proposed Order contains a Provision for a study to determine whether EC and TDS exceed the Agriculture Irrigation Objectives in the receiving water. The Provision allows the proposed Order to be reopened if new data indicate Effluent Limitations are necessary.

EC (Electrical Conductivity, also Specific Conductance)
To protect the beneficial use of water for agricultural use, studies have recommended an Agricultural Water Quality Goal of 700 µmhos/cm, for EC. The California Department of Health Services has recommended an SMCL for EC of 900 µmhos/cm, with an upper level of 1600 µmhos/cm, and a short-term level of 2200 µmhos/cm.

In the Basin Plan, Numeric Water Quality Objectives for the protection of beneficial uses have been established for EC in the Sacramento River, between the Colusa Basin Drain and the "I" Street Bridge and in the Feather River, from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Rock Creek is eventually tributary to the Feather River between the Fish Barrier Dam and the Sacramento River. The Basin Plan water quality objectives for EC are further explained above. However, sampling shows there is assimilative capacity in the Sacramento and Feather Rivers for the dissolved salts discharged from SMD1.

Effluent monitoring results submitted by the Discharger (see Table 6) include reported concentrations of EC, in twelve samples, at 480, 580, 620, 630, 650, 650, 680, 690, 690, 730, 730, and 840 µmhos/cm. The effluent EC values do not exceed the SMCL and it appears there is assimilative capacity in the Sacramento and Feather Rivers for the dissolved salts, including EC, discharged from SMD1. The three samples with the highest concentrations exceeded the Agriculture Water Quality Goal in the effluent.

The monitoring results submitted by the Discharger did not contain data for EC concentrations in the receiving water and it is not possible to determine whether the Agriculture Irrigation Objectives were exceeded in the receiving water. Therefore, the proposed Order contains a Provision for a study with a compliance schedule to determine whether concentrations of EC in the receiving water exceed the Agriculture Irrigation Objectives. The Provision allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

TDS (Total Dissolved Solids)
The California Department of Health Services has recommended an SMCL for TDS of 500 mg/l. To protect the beneficial use of water for agricultural use, studies have recommended an Agricultural Water Quality Goal of 450 mg/l for TDS (lower than the SMCL). Effluent monitoring results submitted by the Discharger (see Table 6) include reported concentrations of TDS in twelve samples, at 240, 310, 330, 330, 340, 340, 340, 360, 360, 360, 370, and 400 mg/l.

While none of the concentrations exceeded the goal, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined above describing the Reasonable Potential Analysis for Chloride.)

For TDS

n = 12 and **Highest Value = 400 mg/l**

n = 12 $\Rightarrow$ **C_V = 0.1149**

n = 12 and **C_V = 0.1149** $\Rightarrow$ **Multiplication Factor = 1.22** (Table 3-1 of the TSD)

400 mg/l x 1.22 = 488 mg/l

488 mg/l > 450 mg/l $\Rightarrow$ Reasonable Potential exists to exceed Agriculture Irrigation Goal in Effluent

The Reasonable Potential analysis indicates a statistical probability for TDS in the effluent to exceed the Agriculture Irrigation goal. The monitoring results submitted by the Discharger did not contain data for TDS concentrations in the receiving water and it is not possible to determine whether the Agriculture Irrigation Objectives were exceeded in the receiving water. Therefore, the proposed Order contains a Provision for a study with a compliance schedule to determine whether concentrations of TDS in the

receiving water exceed the Agriculture Irrigation Objectives. The Provisions allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

* Calculation of C_V for Total Dissolved Solids Data:

Y	f	fY	$y = \lvert Y - \overline{Y} \rvert$	y^2	fy^2
240	1	240	100	10,000	10,000
310	1	310	30	900	900
330	2	660	10	100	200
340	3	1,020	0	0	0
360	3	1,080	20	400	1,200
370	1	370	30	900	900
400	1	400	60	3,600	3,600
Totals	$\sum f = 12$	$\sum fY = 4,080$			$\sum fy^2 = 16,800$

Iron Concentration (µg/l) = Y
Frequency = f
Number of Samples = $n = \sum f = 12$

Mean $= \overline{Y} = \frac{\sum fY}{n} = \frac{4080}{12} = 340$

Standard Deviation $= S = \sqrt{\frac{\sum fy^2}{n-1}} = \sqrt{\frac{16,800}{11}} = \sqrt{1527.27} = 39.08$

Coefficient of Variation $= C_V = \frac{S}{\overline{Y}} = \frac{39.08}{340} = 0.1149$

Analytical Reporting Limits Higher Than Criteria Concentrations/Detected Concentration Just Below Criterion

A substantial number of constituents including Volatile Organics, Semi-Volatile Organics, Inorganics, and Pesticides and PCB's were not analyzed at or below the criterion concentration by commercial laboratories. Therefore, reasonable potential cannot be determined accurately at this time for the following constituents:

CONSTITUENTS ANALYZED ABOVE CRITERIA

VOLATILE ORGANICS	***SEMI VOLATILE ORGANICS***	***PESTICIDES - PCBS***
1,1-Dichloroethene	1,2-Benzanthracene	4,4-DDD
1,1,2,2-Tetrachloroethane	1,2-Diphenylhydrazine	4,4-DDE
1,2-Dichloroethane	2-Chlorophenol	4,4-DDT

Acrylonitrile	2,4-Dichlorophenol	alpha-Hexachlorocyclohexane (BHC)
Carbon Tetrachloride	2,4-Dinitrotoluene	gamma-BHC
Dibromochloromethane	2,4,6-Trichlorophenol	Aldrin
Hexachlorobenzene	2,6-Dinitrotoluene	Chlordane
Hexachlorobutadiene	3,3-Dichlorobenzidine	Dieldrin
	Benzidine	Heptachlor
	Benzo(a)pyrene	Heptachlor Epoxide
	Benzo(b)fluoranthene	PCB-1016
INORGANICS and METALS	Benzo(k)fluoranthene	PCB-1221
Cadmium	Bis(2-chloroethyl)ether	PCB-1232
Chromium (VI)	Bis(2-ethylhexyl)phthalate	PCB-1242
Silver	Butyl benzyl phthalate	PCB-1248
Phosphorus	Chrysene	PCB-1254
Sulfide	Di-n-butylphthalate	PCB-1260
	Di-n-octylphthalate	Toxaphene
	Dibenzo(a,h)-anthracene	Atrazine
	Hexachlorocyclopentadiene	Carbofuran
	Indeno(1,2,3-c,d)pyrene	Dibromochloropropane (DBCP)
	N-Nitrosodimethylamine	Diquat
	N-Nitrosodi-n-propylamine	Ethylene Dibromide
		Simazine (Princep)
		2,3,7,8-TCDD (Dioxin)
		Diazinon
		Chlorpyrifos

Effluent Limitations were established for constituents that were reported by the laboratory to be present at concentrations above the reporting limits and the water quality criteria, including Silver, DDE, Heptachlor Epoxide, PCBs, Atrazine, Dioxins and Furans, and Bis(2-ethylhexyl)phthalate.

CONSTITUENTS DETECTED JUST BELOW CRITERIA

VOLATILE ORGANICS
Dichloromethane

Effluent Monitoring data, submitted by the Discharger, contained concentrations of Dichloromethane, in three of seven samples, at 1.2, 2.4, and 3.1 µg/l. The CTR Criterion for Dichloromethane for the protection of Human Health (30-Day Average) for Drinking Water (consumption of water and aquatic organisms) is 4.7 µg/l. The detected concentrations do not exceed but are very close to the Criterion.

The attached Monitoring and Reporting Program requires the Discharger to continue monitoring for Priority Pollutants, including the constituents listed above, and other constituents, once a year in accordance with the SIP, Sections 2.3 and 2.4. The proposed Order also contains a Provision that requires additional Priority Pollutant analysis when flows are greater than 3.5 MGD and the gravity filters are bypassed.

Effluent Limitations Not Required

Regional Board staff reviewed information submitted as part of the application and in studies (see Tables 1 through 6). Effluent limitations were considered for all detected constituents. Effluent Limitations were **not** applied to the following constituents:

All Constituents for which the Laboratory Reported Non-detectable (ND) Concentrations with Acceptable Reporting Limits
The constituents are as follows:

Pesticides (Table 4): Bentazon, beta-BHC, delta-BHC, Di(2-ethylhexyl)adipate, Dibromochloropropane, Endosulfan Sulfate, Endothall, Endrin, Endrin Aldehyde, Glyphosphate, Methoxychlor, Oxamyl, Picloram, and Thiobencarb;

Volatiles (Table 2): 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,3-Dichloropropene, 2-Chloroethyl vinyl ether, Acrolein, Benzene, Bromoform, Bromomethane, Chloroethane, cis-1,2-Dichloroethene, Ethylbenzene, Freon 113, Naphthalene, Styrene, Tetrachloroethene, trans-1,2-Dichloroethene, Trichloroethene, Trichlorofluoromethane, Vinyl Chloride, and Total Xylenes;

Semi-volatiles (Table 3): 2-Chloronaphthalene, 2-methyl-4,6-Dinitrophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2-Nitrophenol, 4-Bromophenyl phenyl ether, 4-Chloro-3-methylphenol, 4-Chlorophenyl phenyl ether, 4-Nitrophenol, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(g,h,i)perylene, Bis(2-chloroethoxy)methane, Bis(2-chloroisopropyl)ether, Dimethyl phthalate, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Isophorone, Naphthalene, Nitrobenzene, N-Nitrosodiphenylamine, Phenanthrene, Phenol, and Pyrene;

Inorganics and Metals (Tables 1 and 6): Asbestos, Beryllium, Cyanide, and Sulfite.

All Constituents for which No Water Quality Criteria Have Been Promulgated
The constituents are Hardness and Phosphorus (see Table 6).

All Constituents with Concentrations Less Than Applicable Water Quality Criteria and/or Negative Reasonable Potential
The constituents are: Antimony, Arsenic, Barium, Cadmium, Chloride, Chlorobenzene, Chloromethane, 1,4-Dichlorobenzene, Chromium (Total) and Chromium III, Chromium VI, Fluoride, Iron, MBAS, Molinate (Ordram), Nickel, Pentachlorophenol, Sulfate, Sulfide, Thallium, and Toluene.

Antimony
DHS has adopted a Drinking Water Standards PMCL for Antimony of 6 µg/l. In monitoring results submitted by the Discharger (see Table 1), both dissolved and total recoverable Antimony was detected in twelve samples, with the highest concentrations of 0.438 and 0.455 µg/l, respectively. All detected Antimony concentrations were well below the PMCL. No effluent limitations for Antimony are included in the proposed Order.

Arsenic
U.S. EPA has adopted a PMCL for Arsenic of 10 µg/l. In monitoring results submitted by the Discharger (see Table 1), both dissolved and total recoverable Arsenic was detected in twelve samples, with the highest concentrations of 0.566 and 0.625 µg/l, respectively. All detected Arsenic

concentrations were well below the PMCL. No effluent limitations for Arsenic are included in the proposed Order.

Barium
DHS has adopted a Drinking Water Standards PMCL for Barium of 1,000 µg/l. In monitoring results submitted by the Discharger (see Table 1) both dissolved and total recoverable Barium was detected in twelve samples, with the highest concentrations of 8.68 and 9.20 µg/l, respectively. All detected Barium concentrations were well below the PMCL. No effluent limitations for Barium are included in the proposed Order.

Cadmium
U.S. EPA adopted the CTR with criteria for Cadmium to protect freshwater aquatic life. The Cadmium criteria are hardness-dependent. In monitoring results submitted by the Discharger (see Table 1) both dissolved and total recoverable Cadmium was detected in twelve samples, with the highest concentrations of 0.111 and 0.072 µg/l, respectively.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the lowest effluent hardness of 61 mg/l the Chronic and Acute Criteria (expressed as the dissolved Cadmium fraction) are calculated to be 1.6 µg/l and 2.5 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Cadmium fraction) are calculated to be 1.7 µg/l and 2.6 µg/l. None of the Cadmium concentrations exceeded the Cadmium Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Cadmium concentrations in the effluent alone do not create toxic conditions.

However, the Discharger also submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Cadmium fraction) are calculated to be 0.68 µg/l and 0.74 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Cadmium fraction) are calculated to be 0.70 µg/l and 0.74 µg/l, respectively. All detected Cadmium concentrations were below the criteria. No effluent limitations for Cadmium are included in the proposed Order.

Chloride
To protect the beneficial use of water for agricultural use, studies have recommended an Agricultural Water Quality Goal of 106 mg/l, for Chloride. Effluent monitoring results submitted by the Discharger (see Table 6) include reported concentrations of Chloride in seven samples at 48, 48, 53, 55, 56, 63, and 65 mg/l.

While none of the concentrations exceeded the goal, Regional Board staff conducted a Reasonable Potential analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based*

Toxics Control (TSD). Box 3-2 on page 53 of the TSD contains an outline of the Reasonable Potential analysis (a statistical procedure), summarized as follows:

Step 1 Determine the total number of observations (n) and the highest value in the data set;
Step 2 Determine the coefficient of variation (C_V) for the data set. For a data set where n<10, the uncertainty in the C_V is too large to calculate a standard deviation or mean with sufficient confidence, therefore the C_V is estimated to equal 0.6. For a data set where n≥10, the C_V is calculated.
Step 3 Knowing n and C_V, determine the appropriate ratio from Table 3-1 or 3-2 on page 54 of the TSD. For the proposed Order, Table 3-1 was used.
Step 4 Multiply the highest value in the data set by the multiplication factor from Table 3-1.
Step 5 Compare the value from Step 4 with the applicable water quality standard. If the value from Step 4 is greater than the water quality standard, there is Reasonable Potential for concentrations of the constituent to exceed the water quality standard.

Note: The SIP contains instructions for including data reported as not detected in the calculation of the C_V: If (a) the number of effluent data points is less than 10, or (b) at least 80 percent of the data are reported as not detected, the C_V shall be set to equal 0.6. When calculating C_V, if an effluent data point is below the detection limit for the pollutant in that sample, one-half of the detection limit shall be used as a value in the calculations.

For Chloride:

n = 12 and **Highest Value = 65 mg/l**

n = 12 ⇒ **C_V = 0.13**

n = 12 and **C_V = 0.13** ⇒ **Multiplication Factor = 1.26** (Table 3-1 of the TSD)

65 mg/l x 1.26 = 81.9 mg/l

81.9 mg/l < 106 mg/l ⇒ **NO** Reasonable Potential exists to exceed Agriculture Irrigation Goal in Effluent

The Reasonable Potential analysis indicates there is not a statistical probability for Chloride to exceed the Agriculture Irrigation goal in the effluent. No effluent limitations for Chloride are included in the proposed Order.

* Calculation of C_V for Chloride Data:

Y	f	fY	$y = \lvert Y - \overline{Y} \rvert$	y^2	fy^2
42	1	42	12.25	150.06	150.06
48	2	96	6.25	39.06	78.12

50	2	100	4.25	18.06	36.12
53	1	53	1.25	1.56	1.56
55	1	55	0.75	0.56	0.56
56	1	56	1.75	3.06	3.06
60	1	60	5.75	33.06	33.06
61	1	61	6.75	45.56	45.56
63	1	63	8.75	76.56	76.56
65	1	65	10.75	115.56	115.56
Totals	$\sum f = 12$	$\sum fY = 651$			$\sum fy^2 = 539.72$

Iron Concentration (µg/l) = Y
Frequency = f
Number of Samples = $n = \sum f = 12$

Mean = $\overline{Y} = \frac{\sum fY}{n} = \frac{651}{12} = 54.25$

Standard Deviation = $S = \sqrt{\frac{\sum fy^2}{n-1}} = \sqrt{\frac{539.72}{11}} = \sqrt{49.07} = 7.80$

Coefficient of Variation = $C_V = \frac{S}{\overline{Y}} = \frac{7.80}{54.25} = 0.13$

Chlorobenzene
DHS has adopted a Drinking Water Standards PMCL for Chlorobenzene of 70 µg/l and U.S. EPA adopted a criterion of 20 µg/l in the National Ambient Water Quality Criteria for Taste and Odor. In monitoring results submitted by the Discharger (see Table 2) Chlorobenzene was estimated by the laboratory to be 0.078 µg/l in one sample, which is below both criteria. No effluent limitations for Chlorobenzene are included in the proposed Order.

Chloromethane
U.S. EPA has issued a Health Advisory for Chloromethane of 3 µg/l. In monitoring results submitted by the Discharger (see Table 2), Chloromethane was estimated by the laboratory to be 0.19 µg/l in one sample, which is below the criterion. No effluent limitations for Chloromethane are included in the proposed Order.

1,4-Dichlorobenzene
DHS has adopted a Drinking Water Standards PMCL for 1,4-Dichlorobenzene of 5 µg/l. In monitoring results submitted by the Discharger (see Table 2), 1,4-Dichlorobenzene was estimated by the laboratory to be in five of twelve samples, with the highest estimated concentration at 0.16 µg/l. All detected 1,4-Dichlorobenzene concentrations were well below the PMCL. No effluent limitations for 1,4-Dichlorobenzene are included in the proposed Order.

Chromium (Total) and Chromium III

For Total Chromium, the California DHS has developed a PMCL of 50 µg/l. Monitoring results submitted by the Discharger (see Table 1), indicated the presence of both dissolved and total recoverable Chromium (Total) in eight of twelve samples, at concentrations of 0.65 and 0.62 µg/l, respectively. All detected Chromium (Total) concentrations were well below the PMCL. No effluent limitations for Chromium (Total) are included in the proposed Order.

For Chromium III, the CTR and U.S. EPA Recommended Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent criteria. For hardness-dependent criteria, worst-case conditions occur at the lowest hardness concentrations. The lowest reported hardness for SMD1, including effluent and Rock Creek, was 20 mg/l. Toxic concentrations in the CTR would be 48 µg/l (dissolved) and 55 µg/l (total recoverable), and toxic concentrations in the Ambient Water Quality Criteria would be 20 µg/l and 23 µg/l, respectively. The concentrations of Chromium (Total) were well below the toxic concentrations for Chromium III. No effluent limitations for Chromium III are included in the proposed Order.

Chromium VI

For Chromium VI, the CTR Criteria for the Protection of Freshwater Aquatic Life are presented for the dissolved fraction as both a Chronic or Continuous Concentration (4-Day Average) of 11 µg/l and an Acute or Maximum Concentration (1-Hour Average) of 16 µg/l. In monitoring results submitted by the Discharger (see Table 6), Chromium VI was estimated by the laboratory to be in two of twelve samples, with the highest estimated concentration at 0.96 µg/l, which is below both criteria. No effluent limitations for Chromium VI are included in the proposed Order.

Fluoride

For Fluoride, the California DHS has developed a PMCL of 2000 µg/l. Monitoring results submitted by the Discharger (see Table 6), indicated the presence of Fluoride in seven of twelve samples, at concentrations up to 280 µg/l, which is below the criterion. No effluent limitations for Fluoride are included in the proposed Order.

Iron

For Iron, the U.S. EPA and the California DHS have developed a Drinking Water Standards Secondary Maximum Level (SMCL) of 300 µg/l. Effluent monitoring results submitted by the Discharger (see Table 1), indicated the presence of Total Recoverable Iron, in twelve samples, at concentrations of 55.7, 61.1, 63.6, 65.5, 66.2, 68.7, 71.4, 76.0, 77.8, 95.2, 109.0, and 110.0 µg/l.

While none of the concentrations exceeded the SMCL, Regional Board staff conducted a Reasonable Potential analysis, as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD), to determine whether there was a statistical probability for the concentration of Iron in the effluent to exceed the SMCL. (The steps of the Reasonable Potential Analysis are outlined in the discussion of Chloride.)

For Iron

1. **n = 12** and **Highest Value = 110.0 µg/l**
2. **n = 12** $\Rightarrow$ **C_V = 0.24**
3. **n = 12** and **C_V = 0.24** $\Rightarrow$ **Multiplication Factor = 1.5** (Table 3-1 of the TSD)
4. **110.0 µg/l x 1.5 = 165 µg/l**
5. **165 µg/l < 300 µg/l** $\Rightarrow$ NO Reasonable Potential exists to exceed the SMCL

The Reasonable Potential Analysis indicated that there is not a statistical probability for Iron in the effluent to exceed the SMCL. Therefore, no effluent limitations are included for Iron.

* Calculation of C_V for Total Recoverable Iron Data:

Y	f	fY	$y = \lvert Y - \overline{Y} \rvert$	y^2	fy^2
55.7	1	55.7	20.98	440.16	440.16
61.1	1	61.1	15.58	242.74	242.74
63.6	1	63.6	13.08	171.09	171.09
65.5	1	65.5	11.18	124.99	124.99
66.2	1	66.2	10.48	109.83	109.83
68.7	1	68.7	7.98	63.68	63.68
71.4	1	71.4	5.28	27.88	27.88
76.0	1	76.0	0.68	0.46	0.46
77.8	1	77.8	1.12	1.25	1.25
95.2	1	95.2	18.52	342.99	342.99
109.0	1	109.0	32.32	1044.58	1044.58
110.0	1	110.0	33.32	1110.22	1110.22
Totals	$\sum f = 12$	$\sum fY = 920.2$			$\sum fy^2 = 3679.87$

Iron Concentration (µg/l) = Y
Frequency = f
Number of Samples = $n = \sum f = 12$

Mean $= \overline{Y} = \frac{\sum fY}{n} = \frac{920.2}{12} = 76.68$

Standard Deviation $= S = \sqrt{\frac{\sum fy^2}{n-1}} = \sqrt{\frac{3679.87}{11}} = \sqrt{334.53} = 18.29$

$$\text{Coefficient of Variation} = C_V = \frac{S}{\bar{Y}} = \frac{18.29}{76.68} = 0.24$$

MBAS (Methylene Blue Activated Substances, Foaming Agents or Surfactants)
For MBAS, the U.S. EPA and the California DHS have developed an SMCL of 500 µg/l (0.50 mg/l). However, the existing Order No. 97-113 included Effluent Limitations for MBAS of 1.0 mg/l as a Monthly Average and 2.0 mg/l as a Daily Maximum; the source of these Effluent Limitations in not clear. To conduct a Reasonable Potential Analysis (determine whether MBAS has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards) the detected concentrations of MBAS must be compared to the SMCL of 500 µg/l.

Effluent monitoring results submitted by the Discharger (see Table 6), indicated the presence of MBAS, in eleven of twelve samples, at concentrations of 0.068, 0.075, 0.075, 0.10, 0.11, 0.11, 0.12, 0.13, 0.14, 0.21, and 0.22 mg/l.

While none of the concentrations exceeded the SMCL, Regional Board staff conducted a Reasonable Potential Analysis as detailed in the U.S. EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD). (The steps of the Reasonable Potential Analysis are outlined below in the discussion for Chloride and the process to calculate C_v is outlined in the discussions for Chloride and Copper)

For MBAS

1. **n = 12** and **Highest Value = 0.22 mg/l**
2. **n = 12** $\Rightarrow$ **C_V = 0.46**
3. **n = 12** and **C_V = 0.46** $\Rightarrow$ **Multiplication Factor = 2.24** (Table 3-1 of the TSD)
4. **0.22 mg/l x 2.24 = 0.493 mg/l**
5. **0.493 mg/l < 0.50 mg/l**
   0.493 mg/l ≈ 0.50 mg/l

The Reasonable Potential Analysis indicated statistically, based on existing data, the highest expected concentration of MBAS is only slightly less than the criterion. When rounded off, the statistically expected maximum concentration is equal to the criterion. The Reasonable Potential Analysis did not indicate a potential to exceed the SMCL criterion.
In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(1), the adoption of less stringent effluent limitations for MBAS is not considered backsliding if information is available which was not available at the time of permit issuance. New monitoring data indicated that there was no reasonable potential to exceed the SMCL.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(i)(B)(2), the adoption of less stringent effluent limitations for MBAS is not considered backsliding if technical mistakes were made in issuing the permit. The Effluent Limitations for MBAS in existing Order No. 97-113 do not appear to be based on water quality standards and no calculations were shown for establishing water quality based Effluent Limitations.

In accordance with Federal Regulations, 40 CFR 122.44(l)(2)(ii), a permit to discharge to surface waters may not be renewed with a less stringent effluent limitation, if implementation of the limitation would result in violation of a water quality standard. The Reasonable Potential Analysis for MBAS indicated that there was a statistical potential for concentrations of MBAS to almost achieve the SMCL. However, statistically, the estimated maximum concentration did not exceed the SMCL.

The proposed Order does not contain Effluent Limitations for MBAS.

Molinate (Ordram)
Molinate is an herbicide but is not a chlorinated hydrocarbon. For Molinate, the California DHS has developed a PMCL of 20 µg/l. Monitoring results submitted by the Discharger (see Table 4), indicated the presence of Molinate in one of seven samples, at a concentration of 2.3 µg/l, which is below the criterion. No effluent limitations for Molinate are included in the proposed Order.

Nickel
U.S. EPA adopted the CTR with criteria for Nickel to protect freshwater aquatic life. The Nickel criteria are hardness-dependent. In monitoring results submitted by the Discharger (see Table 1), both dissolved and total recoverable Nickel was detected in twelve samples, with the highest concentrations of 3.40 and 3.25 µg/l, respectively.

The monitoring data submitted by the Discharger also contained effluent hardness data that ranged between 61 and 340 mg/l. Using the lowest effluent hardness of 61 mg/l the Chronic and Acute Criteria (expressed as the dissolved Nickel fraction) are calculated to be 34 µg/l and 310 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Nickel fraction) are calculated to be 34 µg/l and 310 µg/l. None of the Nickel concentrations exceeded the Nickel Criteria calculated with an effluent hardness of 61 mg/l; therefore, the hardness and Nickel concentrations in the effluent alone do not create toxic conditions.

However, the Discharger also submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, "*When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water…*" The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. Using the receiving water hardness of 20 mg/l and the appropriate equations shown above, the Chronic and Acute Criteria (expressed as the dissolved Nickel fraction) are calculated to be 13 µg/l and 120 µg/l, respectively. Similarly, the Chronic and Acute Criteria (expressed as the total recoverable Nickel fraction) are

calculated to be 13 µg/l and 120 µg/l, respectively. All detected Nickel concentrations were below the criteria. No effluent limitations for Nickel are included in the proposed Order.

Pentachlorophenol
U.S. EPA adopted the CTR with criteria for Pentachlorophenol, for the Protection of Human Health (30-Day Average) of 0.28 µg/l. In monitoring results submitted by the Discharger (see Table 3), Pentachlorophenol was estimated by the laboratory to be in one of six samples at 0.14 µg/l, which is below the criterion. No effluent limitations for Pentachlorophenol are included in the proposed Order.

Sulfate
For Sulfate, the California DHS has developed a Secondary MCL of 250,000 µg/l. Monitoring results submitted by the Discharger (see Table 6), indicated the presence of Sulfate in twelve samples, at concentrations up to 59,000 µg/l, which is below the criterion. No effluent limitations for Sulfate are included in the proposed Order.

Sulfide
Hydrogen Sulfide can be toxic to aquatic organisms. U.S. EPA adopted National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for

Hydrogen Sulfide of 2 µg/l (Instantaneous Maximum). However, there is no approved analytical method for Hydrogen Sulfide. The laboratory analysis is for Sulfide as S and does not distinguish between the Sulfide in Hydrogen Sulfide and other Sulfides.

In monitoring results submitted by the Discharger (see Table 6), Sulfide was detected in five of twelve effluent samples at up to 2.6 µg/l. There are no water quality criteria for Sulfide. The WWTP has not been reported to have the Hydrogen Sulfide odor. No effluent limitations for Sulfide are included in the proposed Order.

Thallium
For Thallium, the CTR Criterion for the Protection of Human Health Sources of Drinking Water (consumption of water and organisms) is 1.7 µg/l as a 30-Day Average. In monitoring results submitted by the Discharger (see Table 1), Thallium was reported in three of twelve samples, with the highest estimated concentration at 0.002 µg/l, which is below the criterion. No effluent limitations for Thallium are included in the proposed Order.

Toluene
DHS has adopted a Drinking Water Standards PMCL for Toluene of 150 µg/l. Monitoring results submitted by the Discharger (see Table 2) contained Toluene in one of five samples at a concentration 0.98 µg/l, which does not exceed the PMCL. Therefore, an Effluent Limitation for Toluene is **not** included in the proposed Order.

Enforcement History

22 March 1996, Administrative Civil Liability Order No. 96-086 and Cease and Desist Order No. 96-087.
Prior to 1996, the Discharger had a history of noncompliance with waste discharge requirements including violations of limits for pH, coliform organisms, Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), turbidity, chlorine, and ammonia. The violations are due to a combination of bypasses, overflows, heavy flows into the facility, operations failures, and inadequate treatment units.

Former Waste Discharge Requirements Order No. 92-116 states, in part, as follows:

*"**A. Discharge Prohibitions:***

2. The bypass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13.

B. Effluent Limitations:

1. The discharge of an effluent in excess of the following limits is prohibited:

Constituents	*Units*	*Period*	*Monthly Average*	*Weekly Average*	*Monthly Median*	*Daily Maximum*
Chlorine Residual After Dechlorination	*mg/l*	*All Year*	*--*	*--*	*--*	*0.02*

2. The average operating turbidity of the effluent for the period of 1 April through 30 November must not exceed 2 NTUs and must not exceed 5 NTUs more than 5% of the time during any 24-hour period.

3. The discharge between 1 April and 30 November shall be an adequately disinfected, oxidized, coagulated, clarified, filtered wastewater (nonrestricted recreational use as defined in Title 22, Division 4, California Code of Regulations, Section 60301. et. seq.)

5. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

D. Receiving Water Limitations

The Discharge shall not cause the following in Dry Creek:

6. Un-ionized ammonia (NH_3) to exceed 0.025 mg/l (as N).

9. Turbidity to increase more than 20 percent over background levels.

10. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units."

An Administrative Civil Liability Order (ACLO) and Cease and Desist Order (C&D) were adopted at the 22 March 1996 meeting of the Regional Board for violations of Order 92-116 as follows:

A. Cease and Desist Order No. 96-087

The turbidity and chlorine residual violations were due primarily to bypasses, overflows, heavy flows into the WWTP, and operations failures at the WWTP. The ammonia and pH violations were due to the inability of the WWTP to remove ammonia adequately from the waste stream. The Cease and Desist Order contained a compliance schedule that required evaluation of the WWTP, short term corrective actions to improve WWTP performance, construction of new ammonia removal facilities to begin by 1 April 1997, and complete construction and full compliance by 1 April 1998.

The Discharger determined that infiltration and inflow into the collection system played a role in the bypasses and overflows at the WWTP. They have undertaken a program to find the infiltration and inflow points, and repair and retrofit the collection system. The Discharger has also installed new overflow tanks and alarms. The Discharger proposed and constructed a third train of RBCs within the required compliance schedule in an attempt to comply with the ammonia limitations.

The improvements to the collection system are ongoing to date. The Cease and Desist Order required that construction be completed by 1 April 1998. However, the newly constructed third RBC, along with the two existing RBCs, failed to reduce ammonia to levels that complied with Receiving Water Limitations. In an effort to reduce violations of the ammonia Receiving Water Limitations, the Discharger has purchased water from Placer County Water Agency and discharged it to Rock Creek for dilution purposes prior to the discharge point. Ammonia violations were reduced but continued to occur. The Discharger has completed significant improvements at the WWTP and to the collection system, however, they have not complied with the schedule in the Cease and Desist Order.

In May 2000, the Discharger submitted a proposal to construct new facilities and retrofit existing facilities to provide additional ammonia removal. Construction began on these new facilities and retrofits in 2002 and has been completed.

B. Administrative Civil Liability Order No. 96-086

The Administrative Civil Liability Order (ACLO) required that the Discharger pay $25,000 to the Cleanup and Abatement Account for the violations described above. The Order also required payment of an additional $25,000 should the Discharger fail to achieve full compliance with the Cease and Desist Order and upon written demand of the Regional Board's Executive Officer.

The Discharger paid the first $25,000 immediately. The Discharger made improvements to the collection system and the treatment facilities, and constructed the third Rotating Biological Contactor in an effort to reduce the discharge of ammonia. Unfortunately, the improvements were not adequate to achieve full compliance with the CDO.

In a letter, dated 16 December 1999, the Executive Officer demanded payment of the additional $25,000, by 7 January 2000, for failure to complete corrective action and eliminate violations of the Receiving Water Limitation for ammonia within the time allotted by the Cease and Desist Order. In a letter to the Executive Officer, dated 6 January 2000, the Discharger explained that significant improvements had been made to the WWTP and collection system, that ammonia levels in the discharge had decreased but have not been eliminated, and that additional ammonia removal facilities were in the design phase. The Discharger requested that payment of the additional $25,000 be deferred to a future date arranged in a meeting between Discharger and Board staff. In a 20 January 2000 letter from the Executive Officer to the Discharger, it was explained that Placer County had not complied with the terms of the ACLO and that Regional Board staff does not have the authority to review or reconsider the ACLO. Therefore payment of the additional $25,000 was required by 31 January 2000. The additional $25,000 was paid 4 February 2000, four days late.

13 September 2000 Notice of Violation

The NPDES permit was renewed in 1997 when the Regional Board adopted Waste Discharge Requirements Order No. 97-113. A 13 September 2000 Notice of Violation (NOV) was sent to the Discharger for the following violations:

a. A 22 June 2000 inspection by Regional Board staff revealed the discharge of foam to the receiving water;

b. An 8 August 2000 plant upset resulted in violations of effluent turbidity, total coliform, BOD, and TSS limitations, and receiving water fecal coliform and turbidity limitations; and

c. The Discharger Self Monitoring Reports from January through July 2000 showed 25 violations of effluent limitations, receiving water limitations, and reporting requirements, including 12 violations of the Receiving Water Limitations for ammonia.

The NOV required that a work plan be submitted by 31 October 2000 for investigating options to reduce foam and to connect an alarm to the plant system to prevent plant upsets similar to the one that occurred 8 August 2000. Because plant improvements were to be completed by mid 2002, that should improve the quality of the discharge, the Discharger was not required to do anything else to mitigate the violations reported in the monitoring reports. The NOV strongly recommended that denitrification be included in the plant upgrades. No work plan was submitted.

16 April 2001 Administrative Civil Liability Complaint No. 5-01-514

An Administrative Civil Liability Complaint (ACLC) was issued 16 April 2001 for violations of effluent limitations and reporting requirements under California Water Code Section 13385. The section of the Water Code requires the Regional Board to assess mandatory penalties of $3000 for the first serious violation within a six month period, for each serious violation, not counting the first, if the discharger commits two or more serious violations within any six month period, and for each serious violation, not counting the first three, if the discharger commits any of several violations four or more times in any six

month period. The Discharger violated effluent limitations and reporting requirements under Section 13385 for a mandatory penalty of $12,000. The violations requiring mandatory minimum penalties included violations of the Effluent Limitations for Total Coliform Organisms, Settleable Solids, Methylene Blue Activated Substances (MBAS), Turbidity, Total Suspended Solids, pH, and Chlorine Residual. The ACLC notified the Discharger that a hearing may be requested at the Regional Board's meeting in mid June 2001 or the hearing may be waived and the penalty paid in full by 4 May 2001. In addition, in lieu of the mandatory penalty for the first serious violation, the Discharger was informed that they might request, by 4 May 2001, to complete a pollution prevention plan or conduct a supplemental environmental project approved by the Executive Officer.

In a 30 April 2001 letter to Regional Board staff, the Discharger disputed the Regional Board's assessment that several of the violations required mandatory penalties. In a 1 May 2001 letter to the Discharger, Regional Board staff provided additional explanation that the mandatory penalties described in the ACLC do apply. In a 4 May 2001 letter, the Discharger notified the Regional Board that payment of the penalty would require approval of the Placer County Board of Supervisors at the next meeting on 29 May 2001. The Discharger paid the $12,000 mandatory penalty on 16 July 2001; 48 days after the County Board's meeting and 73 days after the date specified in the ACLC.

12 July 2001 Notice of Violation
A Notice of Violation (NOV) was issued 12 July 2001 for performing acute toxicity bioassays without the required certification, for failure to keep a log of receiving water conditions, report detection levels for all chlorine analyses, and monitor BOD on three occasions, for effluent ammonia violations on 16 occasions, a pH violation, and an acute toxicity violation, and for an exceedance of the daily maximum chlorine limitation, which is considered a serious violation under California Water Code Section 13385.

The NOV required submittal of a technical report by 10 August 2001 that addresses the violations and chronic toxicity. The Discharger submitted a technical report on 7 August 2001 that included improvements to the reporting procedures and corrective actions that have been or will be taken to prevent similar violations in the future.

Recent Violations
Between May 2001 and September 2003 there have been additional violations of the Effluent and Receiving Water Limitations and reporting requirements of Order 97-113.

A. Violations of Receiving Water Limitations
1. 34 Ammonia violations (including one violation that occurred in July 2003, after recent plant improvements were completed);
2. 1 pH violation; and
3. 1 Turbidity violation;

B. Violations of Effluent Limitations
1. 1 Chlorine Residual violation;
2. 1 Total Coliform Organisms violation; and

3. 1 pH violation;

C. Failures to Report

1. 26 failures to report effluent BOD;
2. 8 failures to report effluent Total Coliform Organisms;
3. 2 failures to report effluent TSS; and
4. Failure to report detected chronic toxicity effects in both 2001 and 2002.

Enforcement Summary

The Regional Board issued Administrative Civil Liability Order No. 96-086 (ACLO) and Cease and Desist Order No. 96-087 (CDO) in 1996 for violations of previous Waste Discharge Requirements Order No. 92-116. The Discharger was required to pay $25,000 immediately and an additional $25,000 should the Discharger fail to comply with the CDO. The Discharger paid the initial $25,000 and made improvements to the collection system and treatment facilities. However, the new facilities failed to comply completely with the CDO and permit limitations and prohibitions. The Discharger paid the second $25,000 on 4 February 2000 and is currently in the process of constructing additional plant improvements. However, the Discharger has not yet complied with the requirements of the CDO issued in 1996.

Due to continued violations of effluent and receiving water limitations and discharge prohibitions in the existing permit (WDRs Order No. 97-113), the Discharger has been issued the following additional enforcement orders:

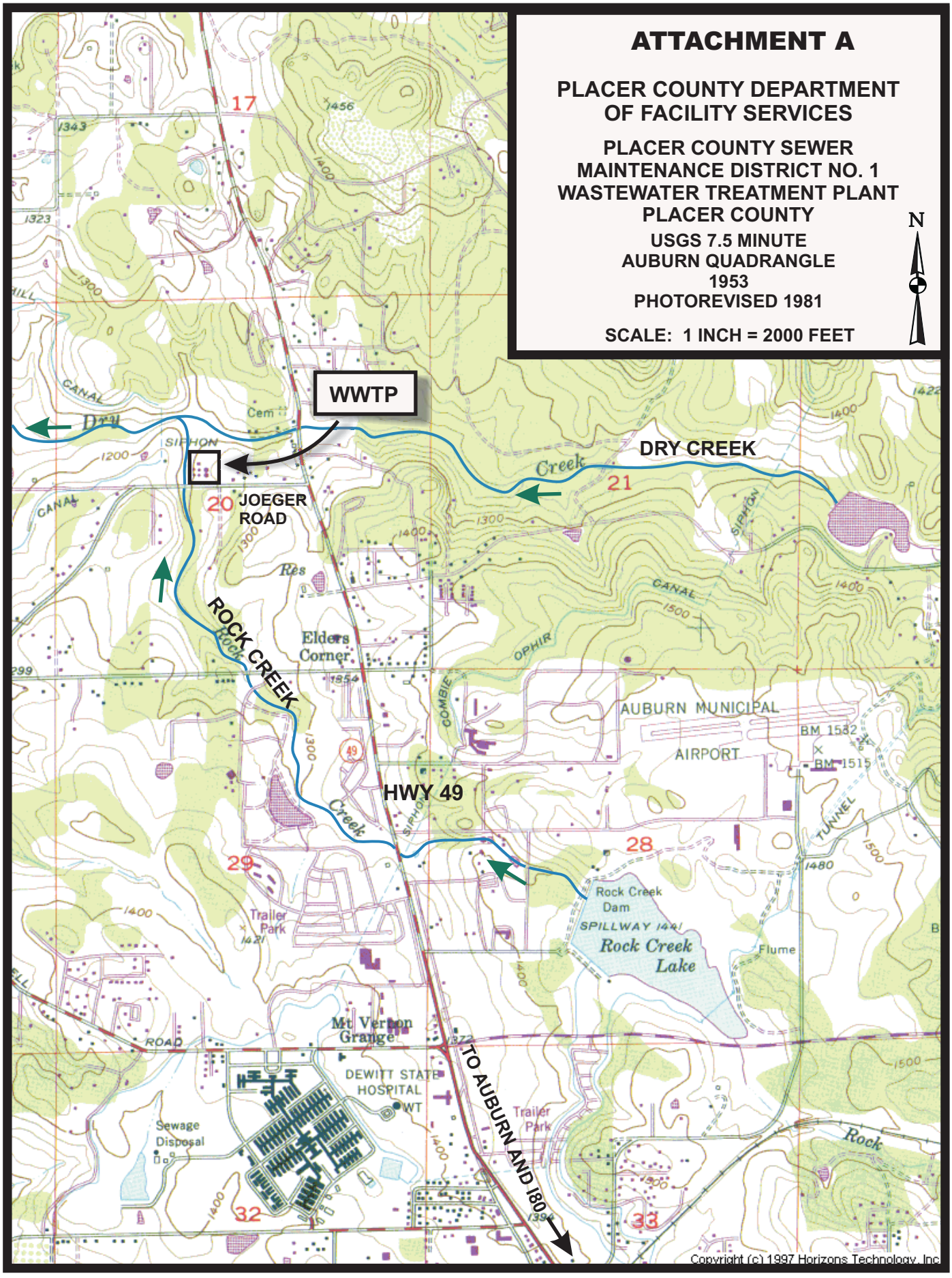
A. A Notice of Violation (NOV) was issued on 13 September 2000 for discharging foam to the receiving water, and for violations of effluent limitations for turbidity, total coliform, BOD, and TSS, and receiving water limitations for fecal coliform, turbidity, and ammonia, and reporting requirements. (Between January and June 2000, there were 25 total effluent limitation violations and 12 ammonia violations.).

B. An Administrative Civil Liability Complaint (ACLC) for $12,000 was issued on 16 April 2001 for violations of effluent limitations and reporting requirements under California Water Code Section 13385. The violations requiring mandatory minimum penalties included violations of the Effluent Limitations for Total Coliform Organisms, Settleable Solids, Methylene Blue Activated Substances (MBAS), Turbidity, Total Suspended Solids, pH, and Chlorine Residual between the months of January and October 2000.

The Discharger disputed the Regional Board's assessment that several of the violations required mandatory penalties. Regional Board staff provided additional explanation that the mandatory penalties described in the ACLC do apply. After additional delays due to the next meeting of the Placer County Board of Supervisors, the Discharger paid the $12,000; 73 days after the date specified in the ACLC.

C. An NOV was issued on 12 July 2001, for the period August 2000 through April 2001. The violations listed were for performing acute toxicity bioassays without the required certification, for failure to keep a log of receiving water conditions, report detection levels for all chlorine analyses, and monitor BOD on three occasions, for receiving water ammonia violations on 16 occasions, a pH violation, and an acute toxicity violation, and for an exceedance of the daily maximum chlorine limitation.

Due to continued violations of Effluent and Receiving Water Limitations in Order No. 97-113 and threatened violations of the proposed Order, rescission of existing Cease and Desist Order No. 96-087 and adoption of a new Cease and Desist Order with updated compliance schedules, are proposed.


ATTACHMENT A
PLACER COUNTY DEPARTMENT OF FACILITY SERVICES
PLACER COUNTY SEWER MAINTENANCE DISTRICT NO. 1
WASTEWATER TREATMENT PLANT
PLACER COUNTY
USGS 7.5 MINUTE
AUBURN QUADRANGLE
1953
PHOTOREVISED 1981
SCALE: 1 INCH = 2000 FEET
N
WWTP
DRY CREEK
JOEGER ROAD
ROCK CREEK
HWY 49
AUBURN MUNICIPAL AIRPORT
Rock Creek Dam
Rock Creek Lake
Mt Vernon Grange
DEWITT STATE HOSPITAL
Sewage Disposal
Trailer Park
Elders Corner
TO AUBURN AND I80
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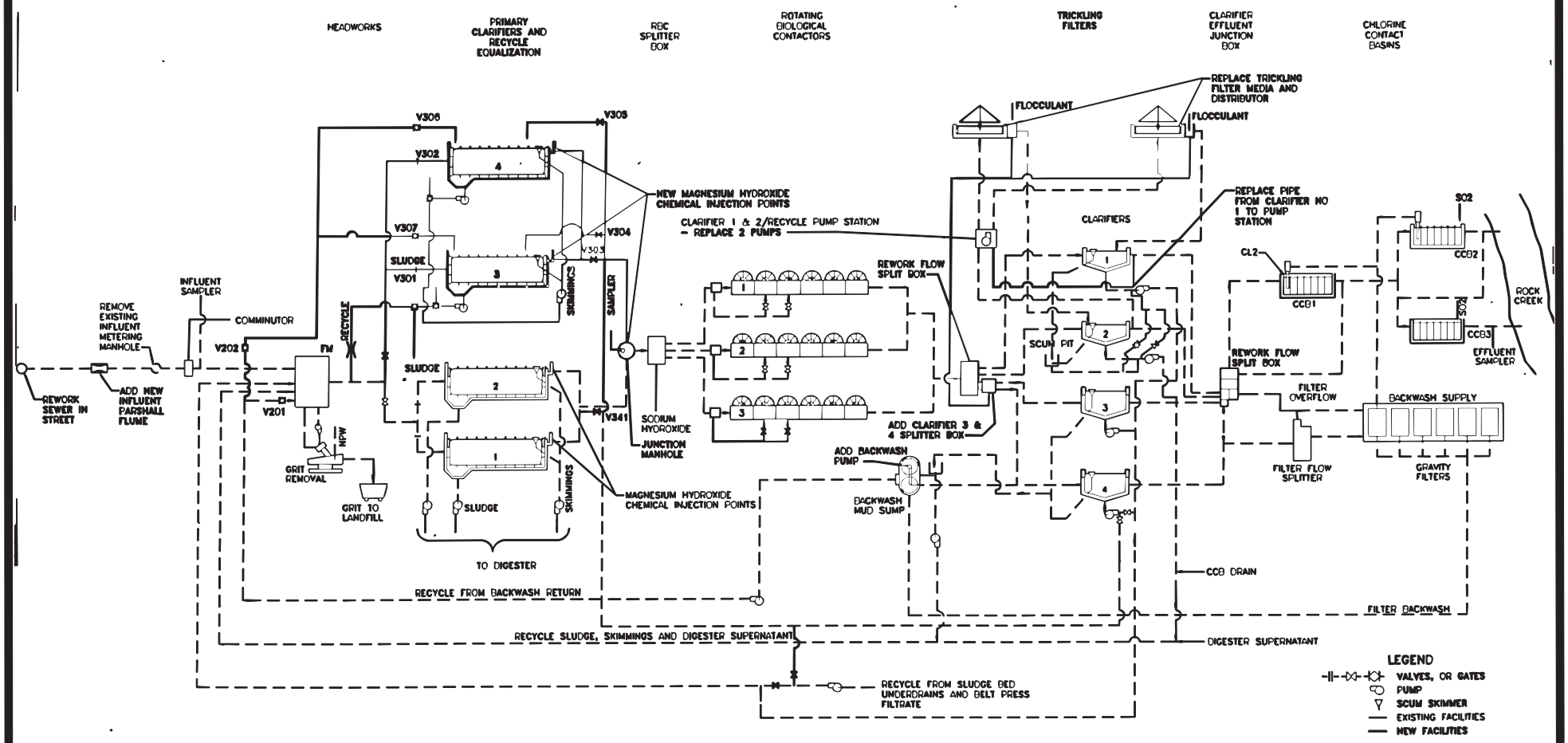
ATTACHMENT B



PROCESS FLOW SCHEMATIC

PLACER COUNTY DEPARTMENT OF FACILITY SERVICES

PLACER COUNTY SEWER MAINTENANCE DISTRICT NO. 1
WASTEWATER TREATMENT PLANT
PLACER COUNTY

From

Owen Engineering &
Management Consultants, Inc.

DJH Engineering

pH-Dependent Effluent Limitations For Ammonia

Criteria Maximum Concentrations (CMC)

Maximum 1-Hour Average

Total Ammonia Nitrogen (in mg N/*l*)

pH	**Ammonia Concentration Limitation** (Salmonids Present) Maximum 1-Hour Average (mg N/*l*)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

$$CMC = \left(\frac{0.275}{1 + 10^{7.204 - \text{pH}}} + \frac{39.0}{1 + 10^{\text{pH} - 7.204}} \right)$$

Temperature- and pH-Dependent Effluent Limitations For Ammonia

2.5 x Criteria Continuous Concentrations (2.5CCC)
Maximum 4-Day Average
Total Ammonia Nitrogen (in mg N/*l*)

	Ammonia Concentration Limitation (Fish Early Life Stages Present)									
	Maximum 4-Day Average (mg N/*l*)									
	Temperature, ºC (ºF)									
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	16.7	16.7	15.1	13.3	11.8	10.3	9.04	7.95	6.99	6.14
6.6	16.4	16.4	14.9	13.1	11.5	10.1	8.91	7.83	6.88	6.05
6.7	16.1	16.1	14.6	12.9	11.3	9.94	8.74	7.68	6.75	5.94
6.8	15.7	15.7	14.3	12.8	11.1	9.71	8.54	7.51	6.60	5.80
6.9	15.3	15.3	13.9	12.2	10.7	9.44	8.30	7.30	6.41	5.64
7.0	14.8	14.8	13.4	11.8	10.4	9.12	8.02	7.05	6.19	5.45
7.1	14.2	14.2	12.9	11.3	9.95	8.75	7.69	6.76	5.94	5.22
7.2	13.5	13.5	12.3	10.8	9.46	8.32	7.31	6.43	5.65	4.97
7.3	12.7	12.7	11.5	10.1	8.91	7.84	6.89	6.05	5.32	4.68
7.4	11.8	11.8	10.8	9.46	8.31	7.31	6.42	5.65	4.96	4.36
7.5	10.9	10.9	9.92	8.72	7.66	6.74	5.92	5.20	4.57	4.02
7.6	9.94	9.94	9.03	7.94	6.98	6.14	5.39	4.74	4.17	3.66
7.7	8.95	8.95	8.13	7.15	6.28	5.52	4.85	4.27	3.75	3.30
7.8	7.96	7.96	7.23	6.36	5.59	4.91	4.32	3.79	3.34	2.93
7.9	6.99	6.99	6.36	5.59	4.91	4.32	3.80	3.34	2.93	2.58
8.0	6.08	6.08	5.53	4.86	4.27	3.76	3.30	2.90	2.55	2.24
8.1	5.24	5.24	4.77	4.19	3.68	3.24	2.85	2.50	2.20	1.93
8.2	4.48	4.48	4.07	3.58	3.15	2.77	2.43	2.14	1.88	1.65
8.3	3.81	3.81	3.46	3.04	2.68	2.35	2.07	1.82	1.60	1.40
8.4	3.22	3.22	2.93	2.58	2.26	1.99	1.75	1.54	1.35	1.19
8.5	2.72	2.72	2.48	2.18	1.91	1.68	1.48	1.30	1.14	1.00
8.6	2.30	2.30	2.09	1.84	1.61	1.42	1.25	1.10	0.964	0.848
8.7	1.95	1.95	1.77	1.55	1.37	1.20	1.06	0.928	0.816	0.717
8.8	1.65	1.65	1.50	1.32	1.16	1.02	0.897	0.788	0.693	0.609
8.9	1.41	1.41	1.28	1.13	0.992	0.872	0.766	0.674	0.592	0.520
9.0	1.22	1.22	1.11	0.971	0.854	0.751	0.660	0.580	0.510	0.448

$$2.5CCC = 2.5\ x\left(\frac{0.0577}{1+10^{\,7.688\,-\,\mathrm{pH}}}+\frac{2.487}{1+10^{\,\mathrm{pH}\,-\,7.688}}\right)\ x\ Min\left(2.85 \text{ or } 1.45 \text{ x } 10^{\,0.028 \text{ x } (25\,-\,T)}\right)$$

Where: T = Temperature in degrees Celsius (°C)

Temperature- and pH-Dependent Effluent Limitations For Ammonia

Criteria Continuous Concentrations (CCC)

Maximum Monthly Average

Total Ammonia Nitrogen (in mg N/*l*)

	Ammonia Concentration Limitation (Fish Early Life Stages Present)									
	Maximum Monthly Average (mg N/*l*)									
	Temperature, ºC (ºF)									
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

$$CCC = \left(\frac{0.0577}{1 + 10^{\,7.688 - \mathrm{pH}}} + \frac{2.487}{1 + 10^{\,\mathrm{pH} - 7.688}} \right) x \; Min \left(2.85 \text{ or } 1.45 \text{ x } 10^{\,0.028 \text{ x } (25 - T)} \right)$$

Where: T = Temperature in degrees Celsius (°C)

Hardness-Dependent Effluent Limitations For Copper

Total Recoverable Copper (in µg/l)

Hardness (mg/*l* as $CaCO_3$)	Copper Concentration Limitations			
	CCC 4-Day Ave. (µg/*l*)	*CMC* 1-Hour Ave. (µg/*l*)	*AMEL* (µg/*l*)	*MDEL* (µg/*l*)
<25	*Calculate*	*Calculate*	*Calculate*	*Calculate*
25	2.9	3.8	2.3	3.8
30	3.3	4.5	2.8	4.5
35	3.8	5.2	3.2	5.2
40	4.3	5.9	3.6	5.9
45	4.7	6.6	4.1	6.6
50	5.2	7.3	4.5	7.3
55	5.6	8.0	4.9	8.0
60	6.0	8.7	5.3	8.6
65	6.5	9.3	5.7	9.3
70	6.9	10	6.1	9.9
75	7.3	11	6.4	10
80	7.7	11	6.8	11
85	8.1	12	7.2	12
90	8.5	13	7.5	12
95	8.9	13	7.9	13
100	9.3	14	8.2	13
110	10	15	8.8	14
120	11	17	9.7	16
130	12	18	11	17
140	12	19	11	17
150	13	21	11	19
160	14	22	12	20
170	15	23	13	22
180	15	24	13	22
190	16	26	14	23
200	17	27	15	24
210	18	28	16	26
220	18	29	16	26
230	19	31	17	27
240	20	32	18	29
250	20	33	18	29
260	21	34	19	30
270	22	36	19	32
280	22	37	19	32
290	23	38	20	33
300	24	39	21	34
310	25	41	22	36
320	25	42	22	36
330	26	43	23	37
340	27	44	24	39
350	27	46	24	39
360	28	47	25	40
370	29	48	26	42
380	29	49	26	42
390	30	50	26	43
400	31	52	27	44
>400	31	52	27	44

CCC = Criteria Continuous Concentration

$= e^{\{0.8545[ln(\text{hardness})] - 1.702\}}$

CMC = Criteria Maximum Concentration

$= e^{\{0.9422[ln(\text{hardness})] - 1.700\}}$

AMEL = Average Monthly Effluent Limitation

$= 1.33[\min(0.664CCC, 0.463CMC)]$

MDEL = Maximum Daily Effluent Limitation

$= 2.16[\min(0.664CCC, 0.463CMC)]$

Hardness-Dependent Effluent Limitations For Lead

Total Recoverable Lead (in µg/l)

Hardness (mg/l as $CaCO_3$)	Lead Concentration Limitations			
	CCC 4-Day Ave. (µg/l)	*CMC* 1-Hour Ave. (µg/l)	*AMEL* (µg/l)	*MDEL* (µg/l)
<25	*Calculate*	*Calculate*	*Calculate*	*Calculate*
25	0.54	14	0.54	0.86
30	0.69	18	0.57	1.1
35	0.84	21	0.70	1.3
40	0.99	25	0.82	1.6
45	1.2	30	1.0	1.9
50	1.3	34	1.1	2.1
55	1.5	38	1.2	2.4
60	1.7	43	1.4	2.7
65	1.8	47	1.5	2.9
70	2.0	52	1.7	3.2
75	2.2	57	1.8	3.5
80	2.4	61	2.0	3.8
85	2.6	66	2.2	4.1
90	2.8	71	2.3	4.5
95	3.0	76	2.5	4.8
100	3.2	82	2.7	5.1
110	3.6	92	3.0	5.7
120	4.0	100	3.3	6.4
130	4.4	110	3.7	7.0
140	4.9	130	4.1	7.8
150	5.3	140	4.4	8.4
160	5.8	150	4.8	9.2
170	6.3	160	5.2	10
180	6.7	170	5.6	11
190	7.2	180	6.0	11
200	7.7	200	6.4	12
210	8.2	210	6.8	13
220	8.7	220	7.2	14
230	9.2	240	7.7	15
240	9.7	250	8.1	15
250	10	260	8.3	16
260	11	280	9.2	18
270	11	290	9.2	18
280	12	300	10	19
290	12	320	10	19
300	13	330	11	21
310	13	340	11	21
320	14	360	12	22
330	15	370	12	24
340	15	390	12	24
350	16	400	13	25
360	16	420	13	25
370	17	430	14	27
380	17	450	14	27
390	18	460	15	29
400	19	480	16	30
>400	19	480	16	30

CCC = Criteria Continuous Concentration

$= e^{\{1.273[ln(\text{hardness})] - 4.705\}}$

CMC = Criteria Maximum Concentration

$= e^{\{1.273[ln(\text{hardness})] - 1.460\}}$

AMEL = Average Monthly Effluent Limitation

$= 1.49[\min(0.559CCC, 0.350CMC)]$

MDEL = Maximum Daily Effluent Limitation

$= 2.85[\min(0.559CCC, 0.350CMC)]$

Hardness-Dependent Effluent Limitations For Silver

Total Recoverable Silver (in µg/l)

Hardness (mg/l as $CaCO_3$)	Silver Concentration Limitations		
	CMC Instantaneous Max. (µg/l)	*AMEL* (µg/l)	*MDEL* (µg/l)
<25	*Calculate*	*Calculate*	*Calculate*
25	0.37	0.13	0.37
30	0.51	0.17	0.51
35	0.67	0.23	0.67
40	0.84	0.29	0.84
45	1.0	0.34	1.0
50	1.2	0.41	1.2
55	1.5	0.51	1.5
60	1.7	0.58	1.7
65	1.9	0.65	1.9
70	2.2	0.75	2.2
75	2.5	0.85	2.5
80	2.8	0.95	2.8
85	3.1	1.1	3.1
90	3.4	1.2	3.4
95	3.7	1.3	3.7
100	4.1	1.4	4.1
110	4.8	1.6	4.8
120	5.6	1.9	5.6
130	6.4	2.2	6.4
140	7.2	2.4	7.2
150	8.2	2.8	8.2
160	9.1	3.1	9.1
170	10	3.4	10
180	11	3.8	11
190	12	4.1	12
200	13	4.4	13
210	15	5.1	15
220	16	5.4	16
230	17	5.8	17
240	18	6.1	18
250	20	6.8	20
260	21	7.1	21
270	22	7.5	22
280	24	8.2	24
290	25	8.5	25
300	27	9.2	27
310	28	9.5	28
320	30	10	30
330	32	11	32
340	33	11	33
350	35	12	35
360	37	13	37
370	39	13	39
380	40	14	40
390	42	14	42
400	44	15	44
>400	44	15	44

CMC = Criteria Maximum Concentration

$= e^{\{1.72[ln(\text{hardness})] - 6.52\}}$

$AMEL$ = Average Monthly Effluent Limitation

$= 2.48(0.137CMC)$

$MDEL$ = Maximum Daily Effluent Limitation

$= 7.29(0.137CMC)$

Hardness-Dependent Effluent Limitations For Zinc

Total Recoverable Zinc (in µg/l)

Hardness (mg/l as $CaCO_3$)	Zinc Concentration Limitations			
	CCC 4-Day Ave. (µg/l)	CMC 1-hour Ave. (µg/l)	*AMEL* (µg/l)	*MDEL* (µg/l)
<25	*Calculate*	*Calculate*	*Calculate*	*Calculate*
25	37	37	26	37
30	43	43	30	43
35	49	49	34	49
40	55	55	39	55
45	61	61	43	61
50	67	67	47	67
55	72	72	50	72
60	78	78	55	78
65	83	83	58	83
70	89	89	62	89
75	94	94	66	94
80	99	99	69	99
85	100	100	70	100
90	110	110	77	110
95	110	110	77	110
100	120	120	84	120
110	130	130	91	130
120	140	140	98	140
130	150	150	110	150
140	160	160	110	160
150	170	170	120	170
160	180	180	130	180
170	190	190	130	190
180	200	200	140	200
190	210	210	150	210
200	220	220	150	220
210	220	220	150	220
220	230	230	160	230
230	240	240	170	240
240	250	250	180	250
250	260	260	180	260
260	270	270	190	270
270	280	280	200	280
280	290	290	200	290
290	300	300	210	300
300	300	300	210	300
310	310	310	220	310
320	320	320	220	320
330	330	330	230	330
340	340	340	240	340
350	350	350	250	350
360	350	350	250	350
370	360	360	250	360
380	370	370	260	370
390	380	380	270	380
400	390	390	270	390
>400	390	390	270	390

CCC = Criteria Continuous Concentration

$= e^{\{0.8473[ln(\text{hardness})] + 0.884\}}$

$CMC = CCC$

$AMEL$ = Average Monthly Effluent Limitation

$= 1.23[\min(0.746CCC, 0.570CMC)]$

$= 1.23(0.570CMC)$

$MDEL$ = Maximum Daily Effluent Limitation

$= 1.75[\min(0.746CCC, 0.570CMC)]$

$= 1.75(0.750CMC)$